CAT Study Materials

Free Study Material from
www.OneStopMBA.com

CAT Quantitative Reasoning (Math)

3 Refresher books covering all relevant topics - starting from Number systems, Percentages to Permutation & Combination to Geometry to Functions.

- A total of 27 topics from Arithmetic, Algebra and Geometry.
- The refresher books contain introduction and explanation on concepts in each topic followed by adequate number of solved examples which cover a wide range of questions that appear from these chapters in CAT.
- Solved examples in the refresher books include **questions that are replicas of questions that appeared in previous CATs**. Such questions are separately identified for your convenience.
- Solved examples are followed by several exercise problems. These problems are provided with answers and detailed explanatory solutions.
- Shortcuts or alternate methods to solve quant questions are provided alongside the solved examples wherever possible.

6 **A book of Chapter wise Tests in Math.**

- Each test comprises 30 to 60 oft-repeated questions.
- The Speed Tests are to be taken after you complete each chapter.
- The tests have been designed to help you consolidate what you have learnt in the respective topic.
- Speed Tests help you identify ways of solving a question in the quickest possible time, when multiple choices are provided.
- Explanatory answers along with correct answers to each question is provided

6 **Quant Proficiency Tests in select Math topics**

- These tests test your proficiency in 1 to 3 chapters in mathematics.
- These tests are to be taken as part of your final revision, about two months before CAT.
- These tests are designed to acquaint you with a variety of CAT - like questions and to help you master concepts in Math and skillfully employ smart techniques in answering these questions.

Math's Course Materials

CAT Quantitative Ability (Quant / Math)

Syllabus, Topics tested in IIM's Common Admissions Test

The Quant (Math) section in CAT usually accounts for a third of the questions in CAT. For instance, in CAT 2006 the quant section had 100 marks worth questions out of the total of 300 marks worth questions. More often than not students who take CAT find the quant section as the toughest one. Albeit, CAT 2006 was an exception

Number Questions & Answers

Ascent's CAT Math Refresher Books cover the following topics

Broadly categorized as Arithmetic, Algebra and Geometry CAT typically tests a student's quantitative ability from over 25 topics. These topics that appear in CAT are of high school level. Click on the links that follow each topic for details of what is covered in Ascent's Quant Refresher books on these topics and for accesing an archive of sample questions from these topics.

I. **Arithmetic**

Number Theory Question bank - CAT 2007 Sample Questions

An oft repeated topic in CAT since CAT 2000. Questions include simple word problems testing one's understanding of applied class="text"cation of LCM, HCF, Factors, Divisibility class="text"ty to questions that would require knowledge of remainders, remainder theorem, factorials, different bases to which numbers can be expressed.

Number Theory: Remainders, Finding Divisors

Remainders of division of different numbers by the same divisor

Question

A number when divided by a divisor leaves a remainder of 24. When twice the original number is divided by the same divisor, the remainder is 11. What is the value of the divisor?

(1) 13
(2) 59
(3) 35
(4) 37

Correct Choice - **(4)**. Correct Answer is **37**

Explanatory Answer

Let the original number be 'a'
Let the divisor be 'd'

Let the quotient of the division of a by d be 'x'

Therefore, we can write the relation as a/d = x and the remainder is 24.
i.e., a = dx + 24

When twice the original number is divided by d, 2a is divided by d.
We know that a = dx + 24. Therefore, 2a = 2dx + 48

The problem states that 2dx + 48 / d   leaves a remainder of 11.
2dx is perfectly divisible by d and will therefore, not leave a remainder.

The remainder of 11 was obtained by dividing 48 by d.
When 48 is divided by 37, the remainder that one will obtain is 11.
Hence, the divisor is 37.

Remainders of division of different numbers by the same divisor

Question

A number when divided by a divisor leaves a remainder of 24. When twice the original number is divided by the same divisor, the remainder is 11. What is the value of the divisor?

(1) 13
(2) 59
(3) 35
(4) 37

Correct Choice - **(4)**. Correct Answer is **37**

Explanatory Answer

Let the original number be 'a'
Let the divisor be'd'

Let the quotient of the division of a by d be 'x'

Therefore, we can write the relation as a/d = x and the remainder is 24.
i.e., a = dx + 24

When twice the original number is divided by d, 2a is divided by d.
We know that a = dx + 24. Therefore, 2a = 2dx + 48

The problem states that 2dx + 48 / d   leaves a remainder of 11.
2dx is perfectly divisible by d and will therefore, not leave a remainder.

The remainder of 11 was obtained by dividing 48 by d.
When 48 is divided by 37, the remainder that one will obtain is 11.
Hence, the divisor is 37.

Number Theory: Counting Methods : Combinatorics

Number of two-digit, three-digit positive integers

Question

How many keystrokes are needed to type numbers from 1 to 1000?

(1) 3001
(2) 2893
(3) 2704
(4) 2890

Correct Choice is **(2)** and Correct Answer is **2893**

Explanatory Answer

1. While typing numbers from 1 to 1000, you have 9 single digit numbers from 1 to 9. Each of them require one keystroke. That is 9 key strokes.

   There are 90 two-digit numbers, from 10 to 99. Each of these numbers require 2 keystrokes. Therefore, one requires 180 keystrokes to type the 2 digit numbers.

   There are 900 three-digit numbers, from 100 to 999. Each of these numbers require 3 keystrokes. Therefore, one requires 2700 keystrokes to type these 3 digit numbers.

   Then 1000 is a four-digit number which requires 4 keystrokes.

   Totally, therefore, one requires 9 + 180 + 2700 + 4 = 2893 keystrokes.

Number Theory: Remainders, Divisors

Remainders of division of two different numbers and their sum by the same divisor

Question

When 242 is divided by a certain divisor the remainder obtained is 8. When 698 is divided by the same divisor the remainder obtained is 9. However, when the sum of the two numbers 242 and 698 is divided by the divisor, the remainder obtained is 4. What is the value of the divisor?

(1) 11
(2) 17
(3) 13
(4) 23

Correct Choice is **(3)** and Correct Answer is **13**

Explanatory Answer

Let the divisor be d.

When 242 is divided by the divisor, let the quotient be 'x' and we know that the remainder is 8.
Therefore, 242 = xd + 8

Similarly, let y be the quotient when 698 is divided by d.
Then, 698 = yd + 9.

242 + 698 = 940 = xd + yd + 8 + 9
940 = xd + yd + 17
As xd and yd are divisible by d, the remainder when 940 is divided by d should have been 17.

However, as the question states that the remainder is 4, it would be possible only when $\dfrac{17}{d}$ leaves a remainder of 4.

If the remainder obtained is 4 when 17 is divided by d, then d has to be 1

Number Theory : Division of Polynomial

Remainders of division of a polynomial

Question

What number should be subtracted from $x^3 + 4x^2 - 7x + 12$ if it is to be perfectly divisible by $x + 3$?

(1) 42
(2) 39
(3) 13
(4) None of these

Correct Choice is **(1)** and Correct Answer is **42**

Explanatory Answer

According to remainder theorem when f(x) / x+a, then the remainder is f(-a).

In this case, as $x + 3$ divides $x^3 + 4x^2 - 7x + 12 - k$ perfectly (k being the number to be subtracted), the remainder is 0 when the value of x is substituted by -3.

i.e., $(-3)^3 + 4(-3)^2 - 7(-3) + 12 - k = 0$

or $-27 + 36 + 21 + 12 = k$

or $k = 42$

Number Theory : HCF, GCD, Factors, Divisors

Word problem in number theory, using the concept of HCF / GCD

Question

What is the minimum number of square marbles required to tile a floor of length 5 metres 78 cm and width 3 metres 74 cm?

(1) 176
(2) 187
(3) 54043
(4) 748

Correct Choice is **(2)** and correct answer is **187**

Explanatory Answer

2. The marbles used to tile the floor are square marbles. Therefore, the length of the marble = width of the marble.
   As we have to use whole number of marbles, the side of the square should a factor of both 5 m 78 cm and 3m 74. And it should be the highest factor of 5 m 78 cm and 3m 74.

5 m 78 cm = 578 cm and 3 m 74 cm = 374 cm.
The HCF of 578 and 374 = 34.

Hence, the side of the square is 34.

The number of such square marbles required = 578*374 / 34*34 = 17*11= 187 marbles.

Number Theory : Division of factorials, remainders

The highest power of 10 that can divide a factorial. Number of trailing zeroes.

Question

A person starts multiplying consecutive positive integers from 20. How many numbers should he multiply before the will have result that will end with 3 zeroes?

(1) 11
(2) 10
(3) 6
(4) 5

Correct Choice is **(3)** and correct answer is **6**

Explanatory Answer

3. A number will end in 3 zeroes when it is multiplied by 3 10s.
   To get a 10, one needs a 5 and a 2.

   Therefore, this person should multiply till he encounters three 5s and three 2s.
   20 has one 5 (5 * 4) and 25 has two 5s (5 * 5).
   20 has two 2s (5 * 2 * 2) and 22 has one 2 (11 * 2).

   Therefore, he has to multiply till 25 to get three 5s and three 2s, that will make three 10s.
   So, he has to multiply from 20 to 25 i.e. 6 numbers.

Number Theory : Remainders of division

Finding remainders when the same power of two numbers leave the same remainder when divided by a common integer.

Question

For what value of 'n' will the remainder of 351^n and 352^n be the same when divided by 7?

(1) 2
(2) 3
(3) 6
(4) 4

Correct Choice is **(2)** and the Correct Answer is **3**

Explanatory Answer

When 351 is divided by 7, the remainder is 1.

When 352 is divided by 7, the remainder is 2.

Let us look at answer choice (1), n = 2

When 351^2 is divided by 7, the remainder will be $1^2 = 1$.

When 352^2 is divided by 7, the remainder will be $2^2 = 4$.

So when n = 2, the remainders are different.

When n = 3,

When 351^3 is divided by 7, the remainder will be $1^3 = 1$.

When 352^3 is divided by 7, the remainder will be $2^3 = 8$.

As 8 is greater than 7, divide 8 again by 7, the new remainder is 1.

So when n = 3, both 351^n and 352^n will have the same remainder when divided by 7.

Number Theory : Remainders of division by 6

Finding remainders when sum of powers of 9 are divided by 6

Question

What is the remainder when 9^1 + 9^2 + 9^3 + ... + 9^8 is divided by 6?

(1) 3
(2) 2
(3) 0

(4) 5

Correct Choice is **(3)** and Correct Answer is **0**

Explanatory Answer

6 is an even multiple of 3. When any even multiple of 3 is divided by 6, it will leave a remainder of 0. Or in other words it is perfectly divisible by 6.

On the contrary, when any odd multiple of 3 is divided by 6, it will leave a remainder of 3. For e.g when 9 an odd multiple of 3 is divided by 6, you will get a remainder of 3.

9 is an odd multiple of 3. And all powers of 9 are odd multiples of 3.
Therefore, when each of the 8 powers of 9 listed above are divided by 6, each of them will leave a remainder of 3.

The total value of the remainder = 3 + 3 + ... + 3 (8 remainders) = 24.
24 is divisible by 6. Hence, it will leave no remainder.

Hence, the final remainder when the expression $9^1 + 9^2 + 9^3 + ... + 9^8$ is divided by 6 will be equal to '0'.

2 .Percent Questions & Answers

Percentages, Ratio Sample Question - CAT 2007

Question 4 the day: March 20, 2006

The question for the day is a sample practice problem in percentages, an Arithmetic Topic.

Question: 1

If the price of petrol increases by 25% and Raj intends to spend only an additional 15% on petrol, by how much % will he reduce the quantity of petrol purchased?

1. 10%
2. 12%
3. 8%
4. 6.67%

Correct Answer - **8%**. Choice (3)

Explanatory Answer

Let the price of 1 litre of petrol be Rs.x and let Raj initially buy 'y' litres of petrol. Therefore, he would have spent Rs. xy on petrol.

When the price of petrol increases by 25%, the new price per litre of petrol is 1.25x.

Raj intends to increase the amount he spends on petrol by 15%.
i.e., he is willing to spend xy + 15% of xy = 1.15xy

Let the new quantity of petrol that he can get be 'q'.
Then, 1.25x * q = 1.15xy
Or q = (1.15xy/1.25x)=(1.15y)/1.25 = 0.92y.

As the new quantity that he can buy is 0.92y, he gets 0.08y lesser than what he used to get earlier.
Or a reduction of 8%.

Percentages - Quant/Math - CAT 2007

Question 4 the day: February 14, 2005

The CAT Math sample question for the day is from the topic Percentages in Arithmetic .

Question: 2

A shepherd has 1 million sheeps at the beginning of Year 2000. The numbers grow by x% (x > 0) during the year. A famine hits his village in the next year and many of

his sheeps die. The sheep population decreases by y% during 2001 and at the beginning of 2002 the shepherd finds that he is left with 1 million sheeps. Which of the following is correct?

1. x > y
2. y > x
3. x = y
4. Cannot be determined

Correct choice **(1)**. Correct Answer - **(x > y)**

Solution:

Let us assume the value of x to be 10%.
Therefore, the number of sheep in the herd at the beginning of year 2001 (end of 2000) will be 1 million + 10% of 1 million = 1.1 million

In 2001, the numbers decrease by y% and at the end of the year the number sheep in the herd = 1 million.
i.e., 0.1 million sheep have died in 2001.

In terms of the percentage of the number of sheep alive at the beginning of 2001, it will be (0.1/1.1)*100 % = 9.09%.

From the above illustration it is clear that x > y.

Percentages - Quant/Math - CAT 2007

Question 4 the day:
April 15, 2004

The question for the day is from the topic Percentages.

Question: 3
In an election contested by two parties, Party D secured 12% of the total votes more than Party R. If party R got 132,000 votes, by how many votes did it lose the election?

(1) 300,000
(2) 168,000
(3) 36,000
(4) 24,000
Correct Answer - **(3)**

Solution:

Let the percentage of the total votes secured by Party D be x%
Then the percentage of total votes secured by Party R = (x − 12)%

As there are only two parties contesting in the election, the sum total of the votes secured by the two parties should total up to 100%

i.e., x + x − 12 = 100
2x − 12 = 100
or 2x = 112 or x = 56%.

If Party D got 56% of the votes, then Party got (56 − 12) = 44% of the total votes.

44% of the total votes = 132,000

i.e., (44/100)*T = 132,000

T = (132,000*100)/44 = 300,000 votes.

The margin by which Party R lost the election = 12% of the total votes
= 12% of 300,000 = 36,000

Percentages - Quant/Math - CAT 2007

Question 4 the day:
April 23, 2003

The question for the day is from the topic Percentages.

Question: 3
A candidate who gets 20% marks fails by 10 marks but another candidate who gets 42% marks gets 12% more than the passing marks. Find the maximum marks.

    (1) 50
    (2) 100
    (3) 150
    (4) 200
Correct Answer - **(2)**

Solution:

From the given statement pass percentage is 42% - 12% = 30%

By hypothesis, 30% of x − 20% of x = 10 (marks)

i.e., 10% of x = 10

Therefore, x = 100 marks.

Percentages - Quant/Math - CAT 2007

Question 4 the day:
March 17, 2003

The question for the day is from the topic Percentages.

Question: 4
When processing flower-nectar into honeybees' extract, a considerable amount of water gets reduced. How much flower-nectar must be processed to yield 1kg of honey, if nectar contains 50% water, and the honey obtained from this nectar contains 15% water?

> (1) 1.5 kgs
> (2) 1.7 kgs
> (3) 3.33 kgs
> (4) None of these

Correct Answer - **(2)**

Solution:

Flower-nectar contains 50% of non-water part.
In honey this non-water part constitutes 85% (100-15).

Therefore 0.5 X Amount of flower-nectar = 0.85 X Amount of honey = 0.85 X 1 kg

Therefore amount of flower-nectar needed = (0.85/0.5) * 1kg = 1.7 kg.

Percentages - Quant/Math - CAT 2007

Question 4 the day:
March 10, 2003

The question for the day is from the topic Percentages.

Question: 5
A vendor sells 60 percent of apples he had and throws away 15 percent of the remainder. Next day he sells 50 percent of the remainder and throws away the rest. What percent of his apples does the vendor throw?

> (1) 17
> (2) 23
> (3) 77
> (4) None of these

Correct Answer - **(2)**

Solution:

Let the number of apples be 100.

On the first day he sells 60% apples ie.,60 apples.Remaining apples =40.

He throws 15% of the remaining i.e., 15% of 40 = 6.Now he has 40-6 = 34 apples

The next day he throws 50% of the remaining 34 apples i.e., 17.

Therefore in all he throws 6+17 =23 apples.

Percentages - Quant/Math - CAT 2007

Question 4 the day:
February 26, 2003
The question for the day is from the topic Percentages.

Question: 6
If the cost price of 20 articles is equal to the selling price of 16 articles, What is the percentage of profit or loss that the merchant makes?

       (1) 20% Profit
       (2) 25% Loss
       (3) 25% Profit
       (4) 33.33% Loss
Correct Answer - **(3)**

Solution:

Let Cost price of 1 article be Re.1.

Therefore, Cost price of 20 articles = Rs. 20.

Selling price of 16 articles = Rs. 20

Therefore, Selling price of 20 articles = (20/16) * 20 = 25

Profit = Selling price - Cost price

= 25 - 20 = 5

Percentage of profit = Profit / Cost price * 100.

= 5 / 20 * 100 = 25% Profit

Percentages - Quant/Math - CAT 2007

Question 4 the day:

August 20, 2002

The question for the day is from the topic Percentages.

Question: 7
30% of the men are more than 25 years old and 80% of the men are less than or equal to 50 years old. 20% of all men play football. If 20% of the men above the age of 50 play football, what percentage of the football players are less than or equal to 50 years?

     (1) 15%
     (2) 20%
     (3) 80%
     (4) 70%
Correct Answer - **(3)**

Solution:

20% of the men are above the age of 50 years. 20% of these men play football. Therefore, 20% of 20% of 4% of the total men are football players above the age of 50 years.

20% of the men are football players. Therefore, 16% of the men are football players below the age of 50 years.

Therefore, the % of men who are football players and below the age of 50 = (16/20*100 = 80%

Percentages - Quant/Math - CAT 2007

Question 4 the day:
August 20, 2002

The question for the day is from the topic Percentages.

Question: 8
30% of the men are more than 25 years old and 80% of the men are less than or equal to 50 years old. 20% of all men play football. If 20% of the men above the age of 50 play football, what percentage of the football players are less than or equal to 50 years?

     (1) 15%
     (2) 20%
     (3) 80%
     (4) 70%
Correct Answer - **(3)**

Solution:

20% of the men are above the age of 50 years. 20% of these men play football. Therefore, 20% of 20% of 4% of the total men are football players above the age of 50 years.

20% of the men are football players. Therefore, 16% of the men are football players below the age of 50 years.

Therefore, the % of men who are football players and below the age of 50 = (16/20*100 = 80%

Percentages - Quant/Math - CAT 2007

Question 4 the day:
June 13, 2002

The question for the day is from the topic Percentages.

Question: 9
If the price of petrol increases by 25%, by how much must a user cut down his consumption so that his expenditure on petrol remains constant?

      (1) 25%
      (2) 16.67%
      (3) 20%
      (4) 33.33%
Correct Answer - **(3)**

Solution:

Let the price of petrol be Rs.100 per litre. Let the user use 1 litre of petrol.
Therefore, his expense on petrol = 100 * 1 = Rs.100

Now, the price of petrol increases by 25%. Therefore, the new price of petrol = Rs.125.

As he has to maintain his expenditure on petrol constant, he will be spending only Rs.100 on petrol.
Let 'x' be the number of litres of petrol he will use at the new price.

Therefore, 125*x = 100 => x = 100/125=4/5 =0.8 litres.
He has cut down his petrol consumption by 0.2 litres = (0.2/1)*100 = 20% reduction.

There is a short cut for solving this problem.

If the price of petrol has increased by 25%, it has gone up 1/4th of its earlier price. Therefore, the % of reduction in petrol that will maintain the amount of money spent on petrol constant = 1/(4+1) = 1/5 = 20%

i.e. Express the percentage as a fraction. Then add the numerator of the fraction to

the denominator to obtain a new fraction. Convert it to percentage - that is the answer.

Percentages - Quant/Math - CAT 2007

Question 4 the day:
May 30, 2002

The question for the day is from the topic Percentages.

Question: 10
Peter got 30% of the maximum marks in an examination and failed by 10 marks. However, Paul who took the same examination got 40% of the total marks and got 15 marks more than the passing marks. What was the passing marks in the examination?

>   (1) 35
>   (2) 250
>   (3) 75
>   (4) 85

Correct Answer - **(4)**

Solution:

Let 'x' be the maximum marks in the examination.

Therefore, Peter got 30% of x = (30/100)x = 0.3x
And Paul got 40% of x = (40/100)*x = 0.4x.
In terms of the maximum marks Paul got 0.4x - 0.3x = 0.1x more than Peter. —— (1)
The problem however, states that Paul got 15 marks more than the passing mark and Peter got 10 marks less than the passing mark.
Therefore, Paul has got 15 + 10 = 25 marks more than Peter. —— (2)

Equating (1) and (2), we get
0.1x = 25 => x = 25/0.1= 250
'x' is the maximum mark and is equal to 250 marks.

We know that Peter got 30% of the maximum marks. Therefore, Peter got (30/100)*250 = 75 marks.
We also know that Peter got 10 marks less than the passing mark. Therefore, the passing mark will be 10 marks more than what Peter got = 75 + 10 = 85.

3. Profit Questions & Answers

Profit, Loss and Discounts - CAT 2007
Question 4 the day : May 2, 2006

The question for the day is a sample practice problem in profit, loss, discounts, an Arithmetic Topic and the problem provides an understanding of the concept of discount and mark up.

Question
If a merchant offers a discount of 40% on the marked price of his goods and thus ends up selling at cost price, what was the % mark up?

1. 28.57%
2. 40%
3. 66.66%
4. 58.33%

Correct Answer - **66.66%**. Choice (3)

Explanatory Answer

If the merchant offers a discount of 40% on the marked price, then the goods are sold at 60% of the marked price.

The question further states that when the discount offered is 40%, the merchant sells at cost price.

Therefore, selling @ 40% discount = 60% of marked price (M) = cost price (C)

i.e., (60/100) M=C

or M =(60/100)C or M = 1.6666 C

i.e., a mark up 66.66%

Profit, Discounts, List Price - CAT 2007 Quant
Question 4 the day : April 3, 2006

The question for the day is a sample practice problem in profit, loss, discounts, an Arithmetic Topic and the problem provides an understanding of the different terms such as Cost Price, List Price, Selling price and margins.

Question:
If a merchant offers a discount of 30% on the list price, then she makes a loss of

16%. What % profit or % loss will she make if she sells at a discount of 10% of the list price?

1. 6% loss
2. 0.8% profit
3. 6.25% loss
4. 8% profit

Correct Answer - **8% profit**. Choice (4)

Explanatory Answer

Let the cost price of the article be Rs.100.
Let the List price of the article by "x".

Then, when the merchant offers a discount of 30%, the merchant will sell the article at x - 30% of x = 70% of x = 0.7x. (1)
Note: Discount is measured as a percentage of list price.

The loss made by the merchant when she offers a discount of 30% is 16%.
Therefore, the merchant would have got 100 - 16% of 100 = Rs.84 when she offered a discount of 30%. (2)
Note: Loss is always measured as a percentage of cost price.

Therefore, equating equations (1) and (2), we get
0.7x = 84
or x = 120.

If the list price is Rs.120 (our assumption of cost price is Rs.100), then when the merchant offers a discount of 10%, she will sell the article at
120 - 10%o of 120 = Rs.108.

As the cost price of the article was Rs.100 and the merchant gets Rs.108 while offering a discount of 10%, she will make a profit of 8%.

Profit, Loss and Discounts - CAT 2007

Question 4 the day : September 2, 2004
The question for the day is a sample practice problem in profit, loss, discounts, an Arithmetic Topic and the problem provides an understanding of the different terms such as Cost Price, List Price, Selling price, Marked Price, Label price, profit margins and loss made, if any.

Question
A merchant marks his goods up by 60% and then offers a discount on the marked price. If the final selling price after the discount results in the merchant making no profit or loss, what was the percentage discount offered by the merchant?

1. 60%
2. 40%
3. 37.5%

4. Depends on the cost price

Correct Answer - **37.5% discount**. Choice (3)

Explanatory Answer

Assume the cost price to be 100.
Therefore, the merchant's marked price will be 100 + 60% of 100 = 160

Now, the merchant offers a discount on the marked price. The discount results in the merchant selling the article at no profit or loss or at the cost price.

That is the merchant has sold the article at 100.

Therefore, the discount offered = 60.

Discount offered is usually measured as a percentage of the marked price.

Hence, % discount =(60/160)*100= 37.5%

Profit, Loss and Discounts - CAT 2007
Question 4 the day : July 22, 2003
The question for the day is from the topic of Profit & Loss. It provides an understanding of the different terms such as Cost Price, List Price, Selling price and margins.

Question
A merchant marks his goods up by 75% above his cost price. What is the maximum % discount that he can offer so that he ends up selling at no profit or loss?

1. 75%
2. 46.67%
3. 300%
4. 42.85%

Correct Answer - **42.85%**. Choice (4)

Explanatory Answer

Let us assume that the cost price of the article = Rs.100
Therefore, the merchant would have marked it to Rs.100 + 75% of Rs.100 = 100 + 75 = 175.

Now, if he sells it at no profit or loss, he sells it at the cost price.
i.e. he offers a discount of Rs.75 on his selling price of Rs.175

Therefore, his % discount = (75/175)*100 = 42.85%

Profit, Loss and Discounts - CAT 2007

Question 4 the day : July 3, 2003

The question for the day is a sample practice problem in profit, loss, discounts, an Arithmetic Topic and the problem provides an understanding of the different terms such as Cost Price, List Price, Selling price and margins.

Question

Two merchants sell, each an article for Rs.1000. If Merchant A computes his profit on cost price, while Merchant B computes his profit on selling price, they end up making profits of 25% respectively. By how much is the profit made by Merchant B greater than that of Merchant A?

1. Rs.66.67
2. Rs.50
3. Rs.125
4. Rs.200

Correct Answer - **Rs.50**. Choice (2)

Explanatory Answer

Merchant B computes his profit as a percentage of selling price. He makes a profit of 25% on selling price of Rs.1000. i.e. his profit = 25% of 1000 = Rs.250

Merchant A computes his profit as a percentage of cost price.
Therefore, when he makes a profit of 25% or $1/4^{th}$ of his cost price, then his profit expressed as a percentage of selling price = $1/(1+4) = 1/5^{th}$ or 20% of selling price.
So, Merchant A makes a profit of 20% of Rs.1000 = Rs.200.

Merchant B makes a profit of Rs.250 and Merchant A makes a profit of Rs.200
Hence, Merchant B makes Rs.50 more profit than Merchant A.

P & L : CP, SP, Ratios - CAT 2007

Question 4 the day : May 12, 2003

The question for the day is a sample practice problem in profit, loss, discounts, an Arithmetic Topic and the problem provides an understanding of the different terms such as Cost Price, List Price, Selling price and margins.

Question

One year payment to the servant is Rs. 200 plus one shirt. The servant leaves after 9 months and recieves Rs. 120 and a shirt. Then find the price of the shirt.

1. Rs. 80
2. Rs. 100
3. Rs. 120
4. Cannot be determined

Correct Answer - **Rs. 120**. Choice (3)

Explanatory Answer

The servant worked for 9 months instead of 12 months, he should receive 9/12 of his annual payment

i.e., ¾ (200 + 1S).

However, the question states that the servant receive Rs. 120 + 1S where S is the price of the shirt.
By equating the two equations we get ¾ (200 + S) = 120 + S.

Therefore Price of the shirt S = Rs. 120.

Profit, Loss and Discounts - CAT 2007
Question 4 the day : April 29, 2003
The question for the day is a sample practice problem in profit, loss, discounts, an Arithmetic Topic.

Question
If apples are bought at the rate of 30 for a rupee. How many apples must be sold for a rupee so as to gain 20%?

1. 28
2. 25
3. 20
4. 22

Correct Answer - **25 apples**. Choice (2)

Explanatory Answer

The merchant makes a profit of 20%.
This means that the merchant sells 30 apples for Rs.1.20

Therefore, selling price of 1 apple = (1.20/30) = Rs.0.04 or 4 paise

The number of apples that can be sold for Rs.1.00 = Rs.1.00/0.04 = 25 apples.

Profit, Loss and Discounts - CAT 2007
Question 4 the day : September 17, 2002
The question for the day is a sample practice problem in profit, loss, discounts.

Question
A trader buys goods at a 19% discount on the label price. If he wants to make a

profit of 20% after allowing a discount of 10%, by what % should his marked price be greater than the original label price?

1. +8%
2. -3.8%
3. +33.33%
4. None of these

Correct Answer is **8% profit**. Correct Choice is **(1)**

Explanatory Answer

Let the label price be = Rs.100. The trader buys at a discount of 19%.
Hence, his cost = 100 - 19 = 81.

He wants to make a profit of 20%. Hence his selling price = 1.2 (81) = 97.2

However, he wants to get this Rs.97.2 after providing for a discount of 10%. i.e. he will be selling at 90% of his marked price.
Hence, his marked price M = 97.2/0.9= 108 which is 8% more than the original label price.

Profit, Loss, Cost Price, Selling Price - CAT 2007
Question 4 the day : August 26, 2002
The question for the day is a sample practice problem in profit, loss, discounts, an Arithmetic Topic and the problem provides an understanding of the different terms such as Cost Price, List Price, Selling price and margins.

Question
Rajiv sold an article for Rs.56 which cost him Rs.x. If he had gained x% on his outlay, what was his cost?

1. Rs.40
2. Rs.45
3. Rs.36
4. Rs.28

Correct Answer - **Rs.40**. Choice (1)

Explanatory Answer

x is the cost price of the article and x% is the profit margin.

Therefore, s.p = $X*(1 + X / 100) = 56 \Rightarrow X*((100+X) / 100) = 56$

So, $100x + x^2 = 5600$.
Solving for 'x' , we get x = 40 or x = -140.
As the price cannot be a -ve quantity, x = 40.

The cost price is 40 and the markup is 40.

It is usually easier to solve such questions by going back from the answer choices as it saves a considerable amount of time.

Profit, Loss, Margins - CAT 2007

Question 4 the day : July 9, 2002

The question for the day is a sample practice problem in profit, loss, discounts, an Arithmetic Topic and the problem provides an understanding of the different terms such as Cost Price, List Price, Selling price and margins.

Question

A trader professes to sell his goods at a loss of 8% but weights 900 grams in place of a kg weight. Find his real loss or gain per cent.

1. 2% loss
2. 2.22% gain
3. 2% gain
4. None of these

Correct Answer is **2.22% gain**. Correct Choice is **(2)**

Explanatory Answer

The trader professes to sell his goods at a loss of 8%.
Therefore, Selling Price = (100 - 8)% of Cost Price
or SP = 0.92CP

But, when he uses weights that measure only 900 grams while he claims to measure 1 kg.
Hence, CP of 900gms = 0.90 * Original CP

So, he is selling goods worth 0.90CP at 0.92CP
Therefore, he makes a profit of 0.02 CP on his cost of 0.9 CP

Profit % = (S.P-C.P / C.P) * 100

i.e., ((0.92-0.90) / 0.90)*100=(0.02/0.90)*100=2 2/9% or 2.22%

Profit, Loss, CP, SP, Margins - CAT 2007

Question 4 the day : April 4, 2002

The question for the day is a sample practice problem in profit, loss, discounts, an Arithmetic Topic and the problem provides an understanding of the different terms

such as Cost Price, List Price, Selling price and margins.

Question

A merchant buys two articles for Rs.600. He sells one of them at a profit of 22% and the other at a loss of 8% and makes no profit or loss in the end. What is the selling price of the article that he sold at a loss?

1. Rs.404.80
2. Rs.440
3. Rs.536.80
4. Rs.160

Correct Answer - **Rs.404.80** . Choice (1)

Explanatory Answer

Let C1 be the cost price of the first article and C2 be the cost price of the second article.
Let the first article be sold at a profit of 22%, while the second one be sold at a loss of 8%.

We know, C1 + C2 = 600.
The first article was sold at a profit of 22%. Therefore, the selling price of the first article = C1 + (22/100)C1 = 1.22C1
The second article was sold at a loss of 8%. Therefore, the selling price of the second article = C2 - (8/100)C2 = 0.92C2.

The total selling price of the first and second article = 1.22C1 + 0.92C2.

As the merchant did not make any profit or loss in the entire transaction, his combined selling price of article 1 and 2 is the same as the cost price of article 1 and 2.

Therefore, 1.22C1 + 0.92C2 = C1+C2 = 600
As C1 + C2 = 600, C2 = 600 - C1. Substituting this in 1.22C1 + 0.92C2 = 600, we get
1.22C1 + 0.92(600 - C1) = 600
or 1.22C1 - 0.92C1 = 600 - 0.92*600
or 0.3C1 = 0.08*600 = 48
or C1 = 48/(0.3) = 160.
If C1 = 160, then C2 = 600 - 160 = 440.
The item that is sold at loss is article 2. The selling price of article 2 = 0.92*C2 = 0.92*440 = 404.80.

Note: When you actually solve this problem in CAT, you should be using the following steps only
1.22C1 + 0.92C2 = C1+C2 = 600
1.22C1 + 0.92(600 - C1) = 600
C1 = 48/(0.3) = 160.
C2 = 600 - 160 = 440.

And the final step of the answer which is 0.92*440 which you should not actually compute. As two of the answer choices (2) and (3) are either 440 or more, they cannot be the answers. The last one is way too low to be 92% of 440, therefore, the answer should be choice (1)

Profit, Loss, Discounts, Markups - CAT 2007

Question 4 the day : April 1, 2002

The question for the day is a sample practice problem in profit, loss, discounts, an Arithmetic Topic and the problem provides an understanding of the different terms such as Cost Price, List Price, Selling price and margins.

Question

A trader makes a profit equal to the selling price of 75 articles when he sold 100 of the articles. What % profit did he make in the transaction?

1. 33.33%
2. 75%
3. 300%
4. 150%

Correct Answer - **300% profit**. Choice (3)

Explanatory Answer

Let S be the selling price of 1 article.
Therefore, the selling price of 100 articles = 100 S. --(1)

The profit earned by selling these 100 articles = selling price of 75 articles = 75 S -- (2)

We know that Selling Price (S.P.) = Cost Price (C.P) + Profit -- (3)
Selling price of 100 articles = 100 S and Profit = 75 S from (1) and (2). Substituting this in eqn (3), we get]

100 S = C.P + 75 S. Hence, C.P = 100 S - 75 S = 25 S.

Profit % =   (Profit/Cost.Price)*100 =(755/255)*100=300%

Typically, you should take about 25 to 30 seconds to crack a problem of this kind. In reality, you should not be writing down all the steps that I have used to explain the solution. You should probably be framing equation (3) directly and compute the last step. The rest of the steps should be done mentally as you read the question for the first time.

Interest Questions & Answers

Interest - Quant/Math - CAT 2008
Question 4 the day:
April 30, 2002

A father left a will of Rs.35 lakhs between his two daughters aged 8.5 and 16 such that they may get equal amounts when each of them reach the age of 21 years. The original amount of Rs.35 lakhs has been instructed to be invested at 10% p.a. simple interest. How much did the elder daughter get at the time of the will?

| (1) | Rs. 17.5 lakhs | (2) | Rs. 21 lakhs | (3) | Rs. 15 lakhs | (4) | Rs. 20 lakhs |

Correct Answer - **(2)**

Solution:

Let Rs.x be the amount that the elder daughter got at the time of the will. Therefore, the younger daughter got (3,500,000 - x).

The elder daughter's money earns interest for (21 - 16) = 5 years @ 10% p.a simple interest
The younger daughter's money earns interest for (21 - 8.5) = 12.5 years @ 10% p.a simple interest.

As the sum of money that each of the daughters get when they are 21 is the same,

x + (5 * 10 * x) / 100= (3,500,000 - x) + (125*10*(3,500,000-x))/100

=> x + (50*x) / 100= 3,500,000 - x + (125/100)*3,500,000- 125x/100

=> 2x + = 3,500,000 (1 + 5/4)

=> (200x+50x+125x) / 100 = (3,500,000)

=> x = 2,100,000 = 21 lakhs

Interests - Quant/Math - CAT 2008
Question 4 the day: June 5, 2002
The question for the day is from the topic of compound interest.

What will Rs.1500 amount to in three years if it is invested in 20% p.a. compound interest, interest being compounded annually?

(1) 2400   (2) 2592   (3) 2678   (4) 2540

Correct Answer - **(2)**

Solution:

The usual way to find the compound interest is given by the formula A = .p(1+(r/100))^n
In this formula, A is the amount at the end of the period of investment
P is the principal that is invested
r is the rate of interest in % p.a
And n is the number of years for which the principal has been invested.

In this case, it would turn out to be A = 1500(1+(20/100))^3
So great. How do you find the value of the above term? It is time consuming.

Let us look at another alternative.
What happens in compound interest?
Interest is paid on interest.
In the first year, interest is paid only on the principal. That is very similar to simple interest.
However, from the second year onwards things change. In the second year, you pay interest on the principal and also interest on interest.

Therefore, the Amount at the end of 2nd year in compound interest can be computed as follows

1 * Principal + 2* Simple interest on principal + 1 * interest on interest.

Similarly, if you were to find the Amount at the end of 3 years in compound interest use the following method

1*Principal + 3 * Simple interest on principal + 3 * interest on interest + 1 * interest on interest on interest

Let us see how it works in our example.
The principal is Rs.1500. The rate of interest is 20%. Therefore, the simple interest on principal is 20% of 1500 = Rs.300
The interest on interest = 20% interest on the interest of Rs.300 = 20% of Rs.300 = Rs.60.
Interest on interest on interest = 20% of Rs.60 = Rs.12.

Now add all these
Amount at the end of 3 years = 1*Principal + 3 * Simple interest on principal + 3 * interest on interest + 1 * interest on interest on interest
= 1500 + 3*300 + 3*60 + 1*12 = 1500 +900 + 1800 +12 = 2592.

You will get the same answer if you had used the formula. However, the calculation in this case was far easier than using the formula.

Try out the same method for four and five years and remember the 1-2-1, 1-3-3-1, 1-4-6-4-1 etc method which you can use comfortably in the exam.

Interest - Quant/Math - CAT 2008

Question 4 the day: July 30, 2002

The question for the day is from the topic Interest.

> If a sum of money grows to 144/121 times when invested for two years in a scheme where interest is compounded annually, how long will the same sum of money take to treble if invested at the same rate of interest in a scheme where interest is computed using simple interest method?

> (1) 9 years   (2) 22 years   (3) 18 years   (4) 33 years

Correct Answer - **(2)**

Solution:

The sum of money grows to times in 2 years.
If P is the principal invested, then it has grown to P in two years when invested in compound interest.

In compound interest, if a sum is invested for two years, the amount is found using the following formula

A=P(1+(r/100))^2 = P in this case.
=>(1+ (r/100))^2=144/121 => (1+ (r/100))^2=(12/11)^2 => 1+ (r/100)=12/11 => r/100 = 1/11 => r=100/11

If r = (100/11) %, then in simple interest the time it will take for a sum of money to treble is found out as follows:

Let P be the principal invested. Therefore, if the principal trebles = 3P, the remaining 2P has come on account of simple interest.

Simple Interest = Pnr/100, where P is the simple interest, r is the rate of interest and 'n' is the number of years the principal was invested.

Therefore, 2P = (Pn*100) / (11*100) => 2 = or n = 22 years.

Interest - Quant/Math - CAT 2008

Question 4 the day: August 08, 2002

The question for the day is from the topic of compound interest.

The population of a town was 3600 three years back. It is 4800 right now. What will be the population three years down the line, if the rate of growth of population has been constant over the years and has been compounding annually?

(1) 6000   (2) 6400   (3) 7200   (4) 9600

Correct Answer - **(2)**

Solution:

The population grew from 3600 to 4800 in 3 years. That is a growth of 1200 on 3600 during three year span.

Therefore, the rate of growth for three years has been
The rate of growth during the next three years will also be the same.
Therefore, the population will grow from 4800 by 4800 * 1/3= 1600
Hence, the population three years from now will be 4800 + 1600 = 6400.

Interest - Quant/Math - CAT 2008

Question 4 the day: August 22, 2002

The question for the day is from the topic of compound interest.

A man invests Rs.5000 for 3 years at 5% p.a. compound interest reckoned yearly. Income tax at the rate of 20% on the interest earned is deducted at the end of each year. Find the amount at the end of the third year.

(1) 5624.32   (2) 5630.50   (3) 5788.125   (4) 5627.20

Correct Answer - **(1)**

Solution:

5% is the rate of interest. 20% of the interest amount is paid as tax. That is 80% of the interest amount stays back. Therefore, if we compute the rate of interest as 80% of 5% = 4% p.a., we will get the same value.

The interest accrued for 3 years in compound interest = 3*simple interest on principal + 3*interest on simple interest + 1*interest on interest on interest. = 3*(200) + 3*(8) + 1*0.32 = 600 + 24 + 0.32 = 624.32

The amount at the end of 3 years = 5000 + 624.32 = 5624.32

Interest - Quant/Math - CAT 2008

Question 4 the day: September 25, 2002

The question for the day is from the topic of Interest.

The difference between the compound interest and the simple interest on a certain sum at 12% p.a. for two years is Rs.90. What will be the value of the amount at the end of 3 years?

(1) 9000   (2) 6250   (3) 8530.80   (4) 8780.80

Correct Answer - **(4)**

Solution:

The difference in the simple interest and compound interest for two years is on account of the interest paid on the first year's interest, when interest is reckoned using compound interest, interest being compounded annually. Hence 12% of simple interest = 90 => simple interest = 90/0.12 =750.

As the simple interest for a year = 750 @ 12% p.a., the principal = 750 / 0.12= Rs.6250.

If the principal is 6250, then the amount outstanding at the end of 3 years = 6250 + 3(simple interest on 6250) + 3 (interest on simple interest) + 1 (interest on interest on interest) = 6250 + 3(750) + 3(90) + 1(10.80) = 8780.80.

Simple & Compound Interest - Quant - CAT 2008
Question 4 the day: February 10, 2003

The question for the day is from the topic of Ratio and Proportion.

Vijay invested Rs.50,000 partly at 10% and partly at 15%. His total income after a year was Rs.7000. How much did he invest at the rate of 10%?

(1) Rs.40,000   (2) Rs.40,000

(3) Rs.12,000   (4) Rs.20,000

Correct Answer - **(2)**

Solution:

The best way to solve this problem is by using the concept in Mixtures and Alligation.

Vijay earned a total income of Rs.7000 for his investment of 50,000.

Therefore, his average rate of return =

By rule of alligation, if the value of one of the products is 10 (cheaper) and the other is 15 (dearer) and if the two are mixed such that the average value of the mixture is 14 (mean price), then the two products have been mixed in the following ratio.

The ratio of

Cheaper product : Dearer product
(Dearer product price - mean price) : (Mean price - cheaper product price)
In our example, the cheaper product is the investment at 10%, the dearer product is the investment at 15% and the mean price is the average return of 14%.

Therefore, the amount invested @10% interest = (1/5) * 50,000= 10,000.

Simple Interest - Quant/Math - CAT 2008
Question 4 the day: May 27, 2003

The question for the day is from the topic of Simple Interest.
> A sum of money invested for a certain number of years at 8% p.a. simple interest grows to Rs.180. The same sum of money invested for the same number of years at 4% p.a. simple interest grows to Rs.120 only. For how many years was the sum invested?

(1) 25 years

(2) 40 years

(3) 33 years and 4 months

(4) Cannot be determined

Correct Answer - **(1)**

Solution:

From the information provided we know that,

Principal + 8% p.a. interest on principal for n years = 180 …….. (1)

Principal + 4% p.a. interest on principal for n years = 120 ……… (2)

Subtracting equation (2) from equation (1), we get

4% p.a. interest on principal for n years = Rs.60.

Now, we can substitute this value in equation (2),

i.e Principal + 60 = 120

= Principal = Rs.60.

We know that SI = pnr / 100, where p is the principal, n the number of years and r the rate percent of interest.

In equation (2), p = Rs.60, r = 4% p.a. and the simple interest = Rs.60.

Therefore, 60 = (60*n*4) / 100

=> n = 100/4 = 25 years.

Interest - Quant/Math - CAT 2008
Question 4 the day: July 9, 2003

The question for the day is from the topic of Interest.
How long will it take for a sum of money to grow from Rs.1250 to Rs.10,000, if it is invested at 12.5% p.a simple interest?

(1) 8 years   (2) 64 years

(3) 72 years   (4) 56 years

Correct Answer - **(4)**

Solution:

Simple interest is given by the formula SI = (pnr/100), where p is the principal, n is the number of years for which it is invested, r is the rate of interest per annum

In this case, Rs. 1250 has become Rs.10,000.

Therefore, the interest earned = 10,000 – 1250 = 8750.

8750 = [(1250*n*12.5)/100]

=> n = 700 / 12.5 = 56 years.

Interest - Quant/Math - CAT 2008
Question 4 the day:
November 13, 2003

The question for the day is from the topic of Interest.
Rs. 5887 is divided between Shyam and Ram, such that Shyam's share at the end of 9 years is equal to Ram's share at the end of 11 years, compounded annually at the rate of 5%. Find the share of Shyam.

(1) 2088   (2) 2000

(3) 3087   (4) None of these

Correct Answer - **(3)**

Solution:

Shyam's share * $(1+0.05)^9$ = Ram's share * $(1 + 0.05)^{11}$

Shyam's share / Ram's share = $(1 + 0.05)^{11}$ / $(1+ 0.05)^9$ = $(1+ 0.05)^2$ = 441/400

Therefore Shyam's share = (441/841) * 5887 = 3087.

Quant/Math - CAT 2008
Question 4 the day: March 29, 2004

The question for the day is from the topic simple and compound interest. Shawn invested one half of his savings in a bond that paid simple interest for 2 years and received Rs.550 as interest. He invested the remaining in a bond that paid compound interest, interest being compounded annually, for the same 2 years at the same rate of interest and received Rs.605 as interest. What was the value of his total savings before investing in these two bonds?

(1) Rs.5500   (2) Rs.11000

(3) Rs.22000   (4) Rs.2750

Correct choice - **(4)**

Solution:

Explanatory Answer

Shawn received an extra amount of (Rs.605 – Rs.550) Rs.55 on his compound interest paying bond as the interest that he received in the first year also earned interest in the second year.

The extra interest earned on the compound interest bond = Rs.55
The interest for the first year =550/2= Rs.275

Therefore, the rate of interest =(55/275) * 100 = 20% p.a.

20% interest means that Shawn received 20% of the amount he invested in the bonds as interest.

If 20% of his investment in one of the bonds = Rs.275, then his total investment in each of the bonds = (275/20)*100 = 1375.

As he invested equal sums in both the bonds, his total savings before investing = 2*1375 = Rs.2750.

Speed Time & Distance Question Answers

Speed, Time and Distance - Quant/Math - CAT 2008

Question 4 the day: September 05, 2002

The question for the day is from the topic of Speed, Time and Distance.

A ship develops a leak 12 km from the shore. Despite the leak, the ship is able to move towards the shore at a speed of 8 km/hr. However, the ship can stay afloat only for 20 minutes. If a rescue vessel were to leave from the shore towards the ship, and it takes 4 minutes to evacuate the crew and passengers of the ship, what should be the minimum speed of the rescue vessel in order to be able to successfully rescue the people aboard the ship?

(1) 53 km/hr   (2) 37 km/hr   (3) 28 km/hr   (4) 44 km/hr

Correct Answer - **(2)**

Solution:

The distance between the rescue vessel and the ship, which is 12 km has to be covered in 16 minutes. (The ship can stay afloat only 20 minutes and it takes 4 minutes to evacuate the people aboard the ship). Therefore, the two vessels should move towards each other at a speed of km/hr = = 45 km/hr.

The ship is moving at a speed of 8 km/hr. Therefore, the rescue vessel should move at a speed of 45 - 8 = 37 km/hr.

Speed, Time and Distance - Quant/Math - CAT 2008

Question 4 the day: September 09, 2002

The question for the day is from the topic of Speed, Time and Distance.

A man driving his bike at 24 kmph reaches his office 5 minutes late. Had he driven 25% faster on an average he would have reached 4 minutes earlier than the scheduled time. How far is his office?

(1) 24 km   (2) 72 km   (3) 18 km   (4) Data Insufficient

Correct Answer - **(3)**

Solution:

Let x km be the distance between his house and office.
While traveling at 24kmph, he would take hours. While traveling at 30 kmph, he would take hours. Therefore, (given in the problem. 5 min late + 4 min early = 9 min)=> x = 18 km

Speed, Time and Distance - Quant/Math - CAT 2008

Question 4 the day: September 23, 2002
The question for the day is from the topic of Speed, Time and Distance.

> **When an object is dropped, the number of feet N that it falls is given by the formula $N = \frac{1}{2}gt^2$ where t is the time in seconds from the time it was dropped and g is 32.2. If it takes 5 seconds for the object to reach the ground, how many feet does it fall during the last 2 seconds?**
>
> (1) 64.4   (2) 96.6   (3) 161.0   (4) 257.6

Correct Answer - (4)

Solution:

In 5 seconds it travels
$\frac{1}{2} * 32.2 * 5^2 = 16.1 * 25 = 402.5$
In first 3 seconds it travels
$\frac{1}{2} * 32.2 * 3^2 = 16.1 * 9 = 144.9$
Hence in the last 2 seconds it traveled 402.5 - 144.9 = 257.6

Speed, Time and Distance - Quant/Math - CAT 2008

Question 4 the day: October 8, 2002

The question for the day is from the topic of Speed, Time and Distance.

> Rajesh traveled from city A to city B covering as much distance in the second part as he did in the first part of this journey. His speed during the second part was twice as that of the speed during the first part of the journey. What is his average speed of journey during the entire travel?
>
> (1) His average speed is the harmonic mean of the individual speeds for the two parts.
>
> (2) His average speed is the arithmetic mean of the individual speeds for the two parts.

(3) His average speed is the geometric mean of the individual speeds for the two parts.

(4) Cannot be determined.

Correct Answer - **(2)**

Solution:

The first part is 1/3rd of the total distance and the second part is 2/3rd of the total distance. He travels at s km/hr speed during the first half and 2s km/hr speed during the second half.

If 3 km is the total distance, then 1 km was traveled at s km/hr and 2 kms was traveled at 2s km/hr speed.

Hence average speed = Total Distance / Total Time = [3 / (1/s + 2/s)] = 3 / (4 / 2s) = 3s / 2. This, however, = s+2s / 2 = 3s / 2 which is the arithmetic mean of the speeds of the two parts.

Speed, Time and Distance - Quant/Math - CAT 2008
Question 4 the day: February 24, 2003

The question for the day is from the topic of Speed, Time and Distance.

Two boys begin together to write out a booklet containing 535 lines. The first boy starts with the first line, writing at the rate of 100 lines an hour; and the second starts with the last line then writes line 534 and so on, backward proceeding at the rate of 50 lines an hour. At what line will they meet?

(1) 356   (2) 277

(3) 357   (4) 267

Correct Answer - **(3)**

Solution:

Writing ratio = 100:50

= 2:1

Since equal quantities are taken,

Therefore in a given time, first boy will be writing the line number

2/3 X 535 Or 356 2/3 Or 357 th Line

Hence, both of them shall meet on 357th line

Time and Distance - Quant/Math - CAT 2008
Question 4 the day: April 08, 2003

The question for the day is from the topic of Time and Distance.

A man and a woman 81 miles apart from each other, start travelling towrds each other at the same time. If the man covers 5 miles per hour to the women's 4 miles per hour, how far will the woman have travelled when they meet?

(1) 27   (2) 36

(3) 45   (4) None of these.

Correct Answer - **(2)**

Solution:

Time taken to meet = Distance between them / Relative speed

= 81/(4 + 5) = 9 hours

Therefore, woman travells = 9 x 4 = 36 miles.

Speed, Time and Distance - Quant/Math - CAT 2008
Question 4 the day: April 28, 2003

The question for the day is from the topic of Speed, Time and Distance.

Two friends A and B run around a circular track of length 510 metres, starting from the same point, simultaneously and in the same direction. A who runs faster laps B in the middle of the 5th round. If A and B were to run a 3 km race long race, how much start, in terms of distance, should A give B so that they finish the race in a dead heat?

(1) 545.45 metres   (2) 666.67 metres

(3) 857.14 metres   (4) Cannot be determined

Correct Answer - **(2)**

Solution:

A and B run around a circular track. A laps B in the middle of the 5thlap. i.e. when A has run four and a half laps he has covered a distance which is 1 lap greater than that covered by B's.

Therefore, when A runs 9/2 laps, B runs 7/2 laps.

Which is the same as saying when A runs 9 laps, B runs 7 laps.

i.e in a race that is 9 laps long, A can give B a start of 2 laps.

So, if the race is of 3000 metres long, then A can give B a start of 2/9 * 3000= 666.67 metres.

The information with regard to the length of the circular track is redundant information.

Speed, Time and Distance - Quant/Math - CAT 2008

Question 4 the day: September 30, 2002

The question for the day is from the topic of Speed, Time and Distance.
> If the wheel of a bicycle makes 560 revolutions in travelling 1.1 km, what is its radius?

> (1) 31.25 cm   (2) 37.75 cm   (3) 35.15 cm   (4) 11.25 cm

Correct Answer - **(1)**

Solution:

The distance covered by the wheel in 560 revolutions = 1100 m . Hence, the distance covered per revolution = metres. The distance covered in one revolution = circumference of the wheel.

Circumference = => r = 31.25 cm.

Pipes and Cisterns - Quant/Math - CAT 2008

Question 4 the day: April 8, 2002

A tank is fitted with 8 pipes, some of them that fill the tank and others that are waste pipe meant to empty the tank. Each of the pipes that fill the tank can fill it in 8 hours, while each of those that empty the tank can empty it in 6 hours. If all the pipes are kept open when the tank is full, it will take exactly 6 hours for the tank to empty. How many of these are fill pipes?

(1) 2   (2) 4   (3) 6   (4) 5

Correct Answer - **(2)**

Solution:

Let the number of fill pipes be 'n'. Therefore, there will be 8-n, waste pipes. Each of the fill pipes can fill the tank in 8 hours. Therefore, each of the fill pipes will fill 1/8th of the tank in an hour.
Hence, n fill pipes will fill n/8th of the tank in an hour.

Similarly, each of the waste pipes will drain the full tank in 6 hours. That is, each of the waste pipes will drain 1/6th of the tank in an hour.
Therefore, (8-n) waste pipes will drain ((8-n)/6)th of the tank in an hour.

Between the fill pipes and the waste pipes, they drain the tank in 6 hours. That is, when all 8 of them are opened, 1/6th of the tank gets drained in an hour.

(Amount of water filled by fill pipes in 1 hour - Amount of water drained by waste pipes 1 hour)
= 1/6th capacity of the tank drained in 1 hour.

n/8 - 8-n / 6 = -1/6 => 6n-64+8n / 48 = -1/6 => 14n-64= -8 or 14n = 56 or n=4

Note: In problems pertaining to Pipes and Cisterns, as a general rule find out the amount of the tank that gets filled or drained by each of the pipes in unit time (say in 1 minute or 1 hour).

Work and Time - Quant/Math - CAT 2008

Question 4 the day: April 15, 2002

If A and B work together, they will complete a job in 7.5 days. However, if A works alone and completes half the job and then B takes over and completes the remaining half alone, they will be able to complete the job in 20 days. How long will B alone take to do the job if A is more efficient than B?

(1) 20 days   (2) 40 days   (3) 30 days   (4) 24 days

Correct Answer - **(3)**

Solution:

Let a be the number of days in which A can do the job alone. Therefore, working alone, A will complete 1/a th of the job in a day.
Similarly, let b the number of days in which B can do the job alone. Hence, B will complete 1/b th of the job in a day.
Working together, A and B will complete (1/a + 1/b) th of the job in a day.
The problem states that working together, A and B will complete the job in 7.5 or 15/2 days. i.e they will complete 2/15th of the job in a day.
Therefore,1/a + 1/b = 2/15 -(1)
From statement 2 of the question, we know that if A completes half the job working alone and B takes over and completes the next half, they will take 20 days.

As A can complete the job working alone in 'a' days, he will complete half the job, working alone, in a/2 days.
Similarly, B will complete the remaining half of the job in b/2 days.
Therefore,a/2+b/2 = 20 => a+b = 40 or a = 40 - b - (2)

From (1) and (2) we get, 1 / 40-b + 1/b = 2/15 => 600=2b(40-b)

=> 600 = 80b - 2b^2
=> b^2 - 40b + 300 = 0
=> (b - 30)(b - 10) = 0
=> b = 30 or b = 10.
If b = 30, then a = 40 - 30 = 10 or
If b = 10, then a = 40 - 10 = 30.

As A is more efficient then B, he will take lesser time to do the job alone. Hence A will take only 10 days and B will take 30 days.

Note: Whenever you encounter work time problems, always find out how much of the work will be completed by A in unit time (an hour, a day, a month etc). Find out how much of the work will be completed by B in unit time and add those to find the amount of work that will be completed in unit time.

If 'A' takes 10 days to do a job, he will do 1/10th of the job in a day. Similarly, if 2/5ths of the job is done in a day, the entire job will be done in 5/2 days.

Work & Time - Quant/Math - CAT 2008
Question 4 the day: April 25, 2002

1. Working together, A and B can do a job in 6 days. B and C can do the same job in 10 days, while C and A can do it in 7.5 days. How long will it take if all A, B and C work together to complete the job?

(1) 8 days

(2) 5 days

(3) 3 days

(4) 7 days

2.
3. How long will it take for A alone to complete the job?

(1) 8 days

(2) 6 days

(3) 10 days

(4) 20 days

Correct Answers

1. (2) 2. (3)

Solution:

Even before you start working on the problem, check out if you can eliminate some answer choices as impossible.

In question (1), we know that if A and B alone work, they can complete the job in 6 days. Therefore, if all three of them A, B and C work together the number of days it will take to complete the job will surely be less than 6 days. Hence, we can eliminate answer choices (1) and (4) right away.

Similarly in question (2), we know that A and B together take 6 days to complete the job. Therefore, A alone will take more than 6 days to complete the job. Therefore, we can eliminate answer choice (2).

In any question, as a rule spend about 5 seconds to see if the answer choices provide any clue to solve the question or help in eliminating one or more obviously absurd choices. This will help you (1) in reducing the time it will take to do the problem and (2) in increasing your probability of success should you choose to take a guess without actually solving the problem.

Question 1

Let A be the number of days that A will take to complete the job alone, B days for B to complete the job alone and C days for C to complete the job alone.

A and B can do a job in 6 days. They complete 1/6 th of the job in a day. i.e.$1/A + 1/B = 1/6$ -- (1)
Similarly, B and C will complete 1/10th of the job in a day. i.e $1 / B + 1/C = 1/10$ -- (2)

And C and A will complete 1/7.5 or 2/15th of the job in a day i.e 1/C + 1/ A = 2/15-- (3).
Adding (1), (2) and (3) we get 1/A + 1/B + 1/B + 1/C + 1/C + 1/A = 1/6 + 1/10 + 2/15
==>2/A + 2/B +2/C = 5+3+4 / 30 or 1/A + 1/B + 1/C = 6/30 = 1/5. i.e working together, A, B and C complete 1/5th of the job in a day. Therefore, they will complete the job in 5 days.

Question 2

Subtracting eqn (2) from eqn (1) we get1/A - 1/C = 1/6 -1/10 = 1/15 --- (4)
Adding eqn (4) and eqn (3) we get,1/A - 1/C + 1/A + 1/C = 2/A = 1/15 + 2/15 = 1/5 or 1/A = 1/10 . i.e. A does 1/10 of the job in a day and therefore, will take 10 days to complete the job working alone.

Pipes and Cisterns - Quant/Math - CAT 2008
Question 4 the day: May 23, 2002
The question for the day is from the topic Pipes and Cisterns. The problems from the topic Pipes and Cisterns and Work and Time are very similar in nature. So, if you understand the nature of one of these types, you will be able to attempt the other quite comfortably.
> Pipe A fills a tank of 700 litres capacity at the rate of 40 litres a minute. Another pipe B fills the same tank at the rate of 30 litres a minute. A pipe at the bottom of the tank drains the tank at the rate of 20 litres a minute. If pipe A is kept open for a minute and then closed and pipe B is kept open for a minute and then closed and then pipe C is kept open for a minute and then closed and the cycle repeated, how long will it take for the empty tank to overflow?
> (1) 42 minutes   (2) 14 minutes   (3) 39 minutes   (4) None of these

Correct Answer - **(4)**

Solution

Pipe A fills the tank at the rate of 40 litres a minute. Pipe B at the rate of 30 litres a minute and Pipe C drains the tank at the rate of 20 litres a minute.

If each of them is kept open for a minute in the order A-B-C, the tank will have 50 litres of water at the end of 3 minutes.

After 13 such cycles, the tank will have 13 * 50 = 650 litres of water.
It will take 13 * 3 = 39 minutes for the 13 cycles to be over.

At the end of the 39th minute, Pipe C will be closed and Pipe A will be opened. It will add 40 litres to the tank.

Therefore, at the end of the 40th minute, the tank will have 650 + 40 = 690 litres of water.

Therefore, at the end of the 40th minute, the tank will have 650 + 40 = 690 litres of water.

At the end of the 40th minute, Pipe A will be closed and Pipe B will be opened. It will add 30 litres of water in a minute.

Therefore, at the end of the 41st minute, the tank will have 690 + 30 = 720 litres of water.
But then at 700 litres, the tank will overflow. Therefore, Pipe B need not be kept open for a full minute at the end of 40 minutes.

Pipe B needs to add 10 more litres of water at the end of 40 minutes. It will take 1/3rd of a minute to fill 10 litres of water.

Therefore, the total time taken for the tank to overflow = 40 minutes + 1/3 of a minute
or 40 minutes 20 seconds.

Pipes and Cisterns - Quant/Math - CAT 2008
Question 4 the day: May 27, 2002

The question for the day is from the topic Pipes and Cisterns. The problems from the topic Pipes and Cisterns and Work and Time are very similar in nature. So, if you understand the nature of one of these types, you will be able to attempt the other quite comfortably.

There are 12 pipes that are connected to a tank. Some of them are fill pipes and the others are drain pipes. Each of the fill pipes can fill the tank in 8 hours and each of the drain pipes can drain the tank completely in 6 hours. If all the fill pipes and drain pipes are kept open, an empty tank gets filled in 24 hours. How many of the 12 pipes are fill pipes?

(1) 6   (2) 8   (3) 7   (4) 5

Correct Answer - **(3)**

Solution

Let there be 'n' fill pipes attached to the tank.
Therefore, there will be 12 - n drain pipes attached to the tank

Each fill pipe fills the tank in 8 hours. Therefore, each of the fill pipes will fill 1/8th of the tank in an hour.
Hence, n fill pipes will fill n*1/8 = n/8 th of the tank in an hour.
Each drain pipe will drain the tank in 6 hours. Therefore, each of the drain pipes will drain 1/6 th of the tank in an hour.
Hence, 12 - n drain pipes will drain(12-n) / 6 = 12-n / of the tank in an hour.
When all these 12 pipes are kept open, it takes 24 hours for an empty tank to overflow. Therefore, in an hour 1/24 thof the tank gets filled.

Hence,n/8 - 12 - n/6 = 1/24.
i.e.3n - 4(12-n) / 24 = 1/24 or 7n - 48 = 1 => 7n = 49 or n = 7.

Work and Time - Quant/Math - CAT 2008 Question 4 the day: June 6, 2002

The question for the day is from the topic work and time.

> Four men and three women can do a job in 6 days. When five men and six women work on the same job, the work gets completed in 4 days. How long will a woman take to do the job, if she works alone on it?
>
> (1) 18 days   (2) 36 days   (3) 54 days   (4) None of these

Correct Answer – (3)

Solution:

Let the amount of work done by a man in a day be 'm' and the amount of work done by a woman in a day be 'w'.

Therefore, 4 men and 3 women will do 4m + 3w amount of work in a day. If 4 men and 3 women complete the entire work in 6 days, they will complete 1/6th of the work in a day.

Hence eqn (1) will be 4m + 3w = 1/6
and from statement (2), eqn (2) will be 5m + 6w = ¼

Solving eqn (1) and eqn (2), we get 3m =1/12 or m = 1/36. i.e. a man does 1/36th of the work in a day. Hence he will take 36 days to do the work.

Substituting the value of m in eqn (1), we get 4 * 1/36 + 3w = 1/6

=> 3w =1/6-1/9 = 3-2 / 18 = 1/18 or w = 1/54. i.e. a woman does 1/54th of the work in a day. Hence she will take 54 days to do the entire work.

Pipes and Cisterns – Quant/Math – CAT 2008
Question 4 the day: June 17, 2002
The question for the day is from the topic – Pipes and Cisterns.

> A pump can be used either to fill or to empty a tank. The capacity of the tank is 3600 m^3. The emptying capacity of the pump is 10 m^3/min higher than its filling capacity. What is the emptying capacity of the pump if the pump needs 12 more minutes to fill the tank than to empty it?

(1) 50 m^3 / min   (2) 60 m^3 / min   (3) 45 m^3 / min   (4) 90 m^3 /min

Correct Answer - (2)

Solution:

Let 'f' m^3/min be the filling capacity of the pump. Therefore, the emptying capacity of the pump will be = (f + 10) m^3 / min.

The time taken to fill the tank will be = 3600 / f minutes
And the time taken to empty the tank will be = 3600 / f+10.
We know that it takes 12 more minutes to fill the tank than to empty it

i.e 3600/f - 3600 / f+10 = 12 => 3600 f + 36000 - 3600 f = 12 (f^2 + 10 f)

=> 36000 = 12 (f^2 + 10 f) => 3000 = f^2 + 10 f => f^2 + 10 f - 3000 = 0.

Solving for positive value of 'f' we get, f = 50.
Therefore, the emptying capacity of the pump = 50 + 10 = 60 m^3 / min

Work and Time - Quant/Math - CAT 2008 Question 4 the day: June 19, 2002
The question for the day is from the topic - Work and Time.

>   Shyam can do a job in 20 days, Ram in 30 days and Singhal in 60 days. If Shyam is helped by Ram and Singhal every 3rd day, how long will it take for them to complete the job?
>
>   (1) 12 days   (2) 16 days   (3) 15 days   (4) 10 days

Correct Answer - (3)

Solution:

As Shyam is helped by Ram and Singhal every third day, Shyam works for 3 days while Ram and Singhal work for 1 day in every 3 days.

Therefore, the amount of work done in 3 days by Shyam, Ram and Singhal = 3/20 + 1/30 + 1/60 = 9+2+1/60 = 12/60 =1/5 th of the job. Hence, it will take them 5 times the amount of time = 3*5 = 15 days.

Pipes and Cisterns - Quant/Math - CAT 2008
Question 4 the day: July 29, 2002
The question for the day is a pipes and cisterns problem.

Pipe A usually fills a tank in 2 hours. On account of a leak at the bottom of the tank, it takes pipe A 30 more minutes to fill the tank. How long will the leak take to empty a full tank if pipe A is shut?

(1) 2 hours 30 minutes   (2) 5 hours   (3) 4 hours   (4) 10 hours

Correct Answer - **(4)**

Solution:

Pipe A fills the tank normally in 2 hours. Therefore, it will fill ½ of the tank in an hour.
Let the leak take x hours to empty a full tank when pipe A is shut. Therefore, the leak will empty 1/4 of the tank in an hour.

The net amount of water that gets filled in the tank in an hour when pipe A is open and when there is a leak = $1/2$ $-1/x$ of the tank. — (1)
When there is a leak, the problem states that Pipe A takes two and a half hours to fill the tank. i.e. 5/2 hours. Therefore, in an hour, 5/2 th of the tank gets filled. – (2)
Equating (1) and (2), we get $1/2$ - $1/x$ =2/5=> 1/x = 1/2 - 2/5 = 1/10 => x = 10 hours.

The problem can also be mentally done as follows.

Pipe A takes 2 hours to fill the tank. Therefore, it fills half the tank in an hour or 50% of the tank in an hour.
When there is a leak it takes 2 hours 30 minutes for the tank to fill. i.e 5/2 hours to fill the tank or 2/5 th or 40% of the tank gets filled.

On account of the leak, (50 - 40)% = 10% of the water gets wasted every hour. Therefore, the leak will take 10 hours to drain a full tank.

Pipes and Cisterns - Quant/Math - CAT 2008

Question 4 the day: August 01, 2002

The question for the day is from the topic Pipes and Cisterns.

There are 12 pipes attached to a tank. Some of them are fill pipes and some are drain pipes. Each of the fill pipes can fill the tank in 12 hours, while each of the drain pipes will take 24 hours to drain a full tank completely. If all the pipes are kept open when the tank was empty, it takes 2 hours for the tank to overflow. How many of these pipes are drain pipes?

(1) 6   (2) 11   (3) 4   (4) 7

Correct Answer - **(3)**

Solution:

There are 12 pipes attached to the tank. Let 'n' of them be fill pipes. Therefore, there will be 12-n drain pipes.

Each fill pipe, fills the tank in 12 hours. Therefore, 1/12th of the tank gets filled every hour by one fill pipe.
'n' fill pipes will, therefore, fill n/12 th of the tank in an hour.

Each drain pipe drains the tank in 24 hours. That is, 1/24 th of the tank gets drained by one drain pipe every hour.
12-n drain pipes, will therefore, drain 12-n / 24 th of the tank in an hour.
When all the pipes are open when the tank is empty, it takes 2 hours for the tank to overflow. i.e. ½ the tank gets filled every hour.

Equating the information, we get n/12 - 12-n/24 = 1/2
=> 2n+n-12 / 24 = 1/2 => 3n - 12 = 12 or 3n = 24 or n = 8.

Therefore, there are 8 fill pipes and (12 - 8) = 4 drain pipes.

Work and Time - Quant/Math - CAT 2008

Question 4 the day: September 27, 2002

The question for the day is from the topic of Work and Time.
> Two workers A and B manufactured a batch of identical parts. A worked for 2 hours and B worked for 5 hours and they did half the job. Then they worked together for another 3 hours and they had to do (1/20)th of the job. How much time does B take to complete the job, if he worked alone?

> (1) 24 hours   (2) 12 hours   (3) 15 hours   (4) 30 hours

Correct Answer - **(3)**

Solution:

Let 'a' hours be the time that worker A will take to complete the job. Let 'b' hours be the time that worker B takes to complete the job. When A works for 2 hours and B works for 5 hours half the job is done. i.e. 2/a + 5/b + 1/2. --- (1)

When they work together for the next three hours, 1/20th of the job is yet to be completed. They have completed half the job earlier and 1/20th is still left. So by working for 3 hours, they have completed 1 - 1/2- 1/20 = 9/20th of the job.

Therefore, 3/a + 3/b = 9/20--- (2).

Solving for (1) and (2), we get b = 15 hours.

Work and Time - Quant/Math - CAT 2008

Question 4 the day: October 16, 2002

The question for the day is from the topic of Work and Time.
   A and B working together can finish a job in T days. If A works alone and
   completes the job, he will take T + 5 days. If B works alone and completes
   the same job, he will take T + 45 days. What is T?
   (1) 25   (2) 60   (3) 15   (4) None of these
Correct Answer - **(3)**

Solution:

The time it will take when A and B work together is given by the formula
$(5*45)^{(1/2)}$ = $225^{(1/2)}$= 15 days. Where 5 and 45 are the extra time that A
and B take to complete the job if the work alone as against working together.

Work, Time - Quant/Math - CAT 2008
Question 4 the day: March 13, 2003

The question for the day is from the topic Work and Time
   A man can do a piece of work in 60 hours. If he takes his son with him and
   both work together then the work is finished in 40 hours. How long will the
   son take to do the same job, if he worked alone on the job?

   (1) 20 hours   (2) 120 hours

   (3) 24 hours   (4) None of these
Correct Answer - **(2)**

Solution:

If the man takes 60 hours to complete the work, then he will finish 1/60 th of the
work in 1 hour.

Let us assume that his son takes x hours to finish the same work.
If they work together for 1 hour they will finish 1/60 + 1/x = 1/40 th of the work.

Therefore, $1/x = 1/120$

The son, working alone would take 120 hours to complete the work.

Work and Time - Quant/Math - CAT 2008

Question 4 the day: October 10, 2002

The question for the day is from the topic of Work and Time.
Pipe A can fill a tank in 'a' hours. On account of a leak at the bottom of the tank it takes thrice as long to fill the tank. How long will the leak at the bottom of the tank take to empty a full tank, when pipe A is kept closed?

(1) (3/2)a hours   (2) (2/3)a   (3) (4/3)a   (4) (3/4)a

Correct Answer - **(1)**

Solution:

Pipe A fills the tank in 'a' hours. Therefore, of the tank gets filled in an hour. On account of the leak it takes 3a hours to fill the tank. Therefore, of the tank gets filled in an hour. Let the leak at the bottom of the tank take 'x' hours to empty the tank. Hence, 1/x of the tank gets emptied every hour.
$1/a - 1/x = 1/3a => 1/x = 1/a - 1/3a = 2/3a$
Hence, $x = 3a/2$

Work and Time - Quant/Math - CAT 2008
Question 4 the day: April 15, 2003

The question for the day is from the topic of Work and Time.
A, B and C can do a work in 5 days, 10 days and 15 days respectively. They started together to do the work but after 2 days A and B left. C did the remaining work (in days)

(1) 1   (2) 3

(3) 5   (4) 4

Correct Answer - **(4)**

Solution:

If A, B and C work together for a day then they will finish $(1/5 + 1/10 + 1/15)^{th}$ work = $11/30^{th}$ work.

Therefore working together for two days they will finish 2 * 11/30 = 11/15th work.

C alone does remain (11/15 – 1) 4/15th work.

But C finishes 1/15th work in one day. Therefore C will finish 4/15th work in 4 days.

Time and Work - Quant/Math - CAT 2008
Question 4 the day: June 13, 2003

The question for the day is from the topic of Time and Work.
X alone can do a piece of work in 15 days and Y alone can do it in 10 days. X and Y undertook to do it for Rs. 720. With the help of Z they finished it in 5 days. How much is paid to Z?

(1) Rs. 360   (2) Rs. 120

(3) Rs. 240   (4) Rs. 300

Correct Answer - **(2)**

Solution:

In one day X can finish 1/15th of the work.

In one day Y can finish 1/10th of the work.

Let us say that in one day Z can finish 1/Zth of the work.

When all the three work together in one day they can finish 1/15 + 1/10 + 1/Z = 1/5th of the work.

Therefore, 1/Z = 1/30.

Ratio of their efficiencies = 1/15: 1/10: 1/30 = 2: 3: 1.Therefore Z receives 1/6th of the total money.

According to their efficiencies money is divided as 240: 360: 120.

Hence, the share of Z = Rs. 120.

Work and Time - Quant/Math - CAT 2008
Question 4 the day: June 27, 2003

The question for the day is from the topic of Work and Time.
Ram starts working on a job and works on it for 12 days and completes 40% of the work. To help him complete the work, he employs Ravi and together

they work for another 12 days and the work gets completed. How much more efficient is Ram than Ravi?

(1) 50%   (2) 200%

(3) 60%   (4) 100%

Correct Answer - **(4)**

Solution:

Ram completes 40% of work in 12 days.

i.e. another 60% of the work has to be completed by Ram and Ravi. They have taken 12 days to complete 60% of the work.

Therefore, Ram and Ravi, working together, would have completed the entire work in (12/60)*100 = 20 days.

As Ram completes 40% of the work in 12 days, he will take (12/40)*100 = 30 days to complete the entire work

Working alone, we know Ram takes 30 days to complete the entire work. Let us assume that Ravi takes 'x' days to complete the entire work, if he works alone. And together, they complete the entire work in 20 days.

Therefore, (1/30) + (1/x) = (1/20) => (1/x) = (1/20) - (1/30) = (1/60)

Therefore, Ravi will take 60 days to complete the work, if he works alone.

Hence Ram is 100% more efficient than Ram.

Work & Time - Quant/Math - CAT 2008
Question 4 the day: August 08, 2003

The question for the day is from the topic of Work & Time.
A red light flashes 3 times per minute and a green light flashes 5 times in two minutes at regular intervals. If both lights start flashing at the same time, how many times do they flash together in each hour?

(1) 30   (2) 24

(3) 20   (4) 60

Correct Answer - **(1)**

Solution:

Red light flashes every 20 seconds

Green light flashes every 24 seconds

Therefore, they will flash together every 120 seconds

In every hour they will flash 3600/120 = 30 times

Races Questions & Answers

Races - Quant/Math - CAT 2008
Question 4 the day: June 18, 2002
The question for the day is from the topic - Races.
> A takes 3 min 45 seconds to complete a kilometre. B takes 4 minutes to complete the same 1 km track. If A and B were to participate in a race of 2 kms, how much start can A give B in terms of distance?

> (1) 30 m   (2) 62.5 m   (3) 125 m   (4) 250 m

Correct Answer - **(3)**

Solution:

A can give B a start of 15 seconds in a km race.
B takes 4 minutes to run a km. i.e 1000/4= 250 m/min = 250/60 m/sec
Therefore, B will cover a distance of 250/60 * 15 = 62.5 meters in 15 seconds.
The start that A can give B in a km race therefore, is 62.5 meters, the distance that B run in 15 seconds. Hence in a 2 km race, A can give B a start of 62.5 * 2 = 125 m or 30 seconds.

Races - Quant/Math - CAT 2008
Question 4 the day: July 12, 2002
The question for the day is the from the topic - Races.
> In a kilometre race, A can give B a start of 100 m or 15 seconds. How long does A take to complete the race?

> (1) 150 seconds   (2) 165 seconds   (3) 135 seconds   (4) 66.67 seconds

Correct Answer - **(3)**

Solution:

In a 1000 metre race A gives B a start of 100 m or 15 seconds.

This essentially means that B takes 15 seconds to run 100 m.

Therefore, B will take 150 seconds to run the stretch of 1000 metres. (1000 m = 10 times 100 m and therefore the time taken will also be 10 times 15 seconds = 150 seconds).

As A takes 15 seconds less than B, he will take 135 seconds to run the 1000 m.

Races - Quant/Math - CAT 2008

Question 4 the day: August 07, 2002

The question for the day is from the topic Races.
> A gives B a start of 10 metres in a 100 metre race and still beats him by 1.25 seconds. How long does B take to complete the 100 metre race if A runs at the rate of 10 m/sec?

> (1) 8 seconds   (2) 10 seconds   (3) 16.67 seconds   (4) 12.5 seconds

Correct Answer - **(4)**

Solution:

A gives B a start of 10 metres in a 100 metre race. This means that when A runs 100 metres, B runs only 90 metres.

Despite that start, A beats B by 1.25 seconds.
As A is running at the speed of 10 m/sec, he will take 10 seconds to complete the 100 metre race. And B takes 10 + 1.25 = 11.25 seconds to cover 90 metres.

Therefore, the speed at which B is running = 8 m/sec.
Running at 8 m/sec, B will take 100/8= 12.5 seconds to complete the 100 metre race.
Hence the correct answer is (4).

Ratio, Proportion - Quant/Math - CAT 2008

Question 4 the day: August 28, 2002

The question for the day is from the topic of Ratio, Proportion.
> A predator is chasing its prey. The predator takes 4 leaps for every 6 leaps of the prey and the predator covers as much distance in 2 leaps as 3 leaps of the prey. Will the predator succeed in getting its food?

(1) Yes

(2) In the 6th leap

(3) Never

(4) Cannot determine

Correct Answer - **(4)**

Solution:

Distance covered in 2 leaps by predator = 3 leaps of the prey.
Distance covered in 1 leap of predator = 3/2 leaps of prey. ----(1)

4 leaps of predator : 6 leaps of prey ----(2)

Using (1) and (2), we get
4*3/2 leaps of predator : 6 leaps of prey.
=> 1:1
If the predator and prey start simultaneously at the same point, the predator will catch the prey immediately. If not so, then the predator will never catch the prey as it was running at the same speed.
As it was not mentioned in the question that they start simultaneously from the same point or not, we can't determine the answer. Therefore, the answer choice is (4).

Races - Quant/Math - CAT 2008
Question 4 the day: February 19, 2003

The question for the day is from the topic of Races.
A skating champion moves along the circumference of a circle of radius 21 meters in 44 seconds. How many seconds will it take her to move along the perimeter of a hexagon of side 42 meters?

(1) 56   (2) 84

(3) 64   (4) 48

Correct Answer - **(2)**

Solution:

Circumference 2*22/7 r = 2 * 22/7 *21

= 132 meters

Speed of the skater = Distance covered / Time taken

132/44=3 m/s

Perimeter of hexagon = 6a = 6 X 42

= 252m

Time taken to cover the perimeter of the hexagon = Distance (perimeter) / Speed

252/3=84Seconds

Races - Quant/Math - CAT 2008
Question 4 the day:May 22, 2003

The question for the day is from the topic of Races.
A runs 13/5 times as fast as B. If A gives a start of 240m, how far must the post be so that A and B might reach at the same time.

(1) 390 m   (2) 330 m

(3) 600 m   (4) 720 m

Correct Answer - **(1)**

Solution:

A runs 13/5 times fast as B which means A runs 13 metres for every 5 meters of B.

Therefore, A gains 8 metre in a 11m race or if A gives a start of 8m in a 13m race then the race might end in a dead heat.

Therefore, if A gives a start of 240m (8* 30) then the length of the race should be equal to 13*30 = 390m

Or the length of the race after A gives a start of 240 start so that A and B reach at the same time is given by (240*13) /8 = 390m.

Races - Quant/Math - CAT 2008
Question 4 the day:June 2, 2003

The question for the day is from the topic of Races.
P can give Q a start of 20 seconds in a kilometer race. P can give R a start of 200 meters in the same kilometer race. And Q can give R a start of 20

seconds in the same kilometer race. How long does P take to run the kilometer?

(1) 200 seconds   (2) 240 seconds

(3) 160 seconds   (4) 140 seconds

Correct Answer - **(3)**

Solution:

P can give Q a start of 20 seconds in a kilometer race. So, if Q takes 'x' seconds to run a kilometer, then P will take x − 20 seconds to run the kilometer.

Q can give R a start of 20 seconds in a kilometer race. So, if R takes 'y' seconds to run a kilometer, then Q will take y − 20 seconds to run the kilometer.

We know Q takes x seconds to run a kilometer
Therefore, x = y − 20

Therefore, P will take x − 20 = y − 20 − 20 = y − 40 seconds to run a kilometer.

i.e. P can give R a start of 40 seconds in a kilometer race, as R takes y seconds to run a kilometer and P takes only y − 40 seconds to run the kilometer.

We also know that P can give R a start 200 meters in a km race.
This essentially means that R runs 200 meters in 40 seconds.
Therefore, R will take 200 seconds to run a km.

If R takes 200 seconds to run a km, then P will take 200 − 40 = 160 seconds to run a km.

Races - Quant/Math - CAT 2008
Question 4 the day:June 30, 2003

The question for the day is from the topic of Races.
> A gives B a start of 30 seconds in a km race and still beats him by 20 m. However, when he gives B a start of 35 seconds, they finish the race in a dead heat. How long does A take to run the km?

(1) 250 seconds   (2) 285 seconds

(3) 220 seconds   (4) 215 seconds

Correct Answer - **(4)**

Solution:

When A gives B a start of only 30 seconds, he beats him by 20 m.

But, when he gives him a start of 35 seconds, they finish the race in a dead heat

Essentially, B is able to run 20 m in the extra 5 second start that he gets in the second instance.

Hence, B's speed = 20/5 = 4 m/sec.

As B runs at 4 m/sec speed, he will take 1000 / 4 = 250 seconds to complete a km.

A can give B a start of 35 seconds in a km race. Hence, A will take only 215 seconds to run the km.

Races - Quant/Math - CAT 2008
Question 4 the day: August 13, 2003

The question for the day is from the topic of Races.
Three runners A, B and C run a race, with runner A finishing 12 meters ahead of runner B and 18 meters ahead of runner C, while runner B finishes 8 meters ahead of runner C. Each runner travels the entire distance at a constant speed.

What was the length of the race?

(1) 36 meters   (2) 48 meters

(3) 60 meters   (4) 72 meters

Correct Answer - **(2)**

Solution:

Go from answer choices

Let the race be of length 48 meters

So when A runs 48m B run 36m and C runs 30m

Ratio of distance covered by B : C = 6 : 5

So when B covers 48m C would have covered 40m => B can give C a start of 8m.

Races - Quant/Math - CAT 2008
Question 4 the day: September 09, 2003

The question for the day is from the topic of Races.

A can give B a start of 50 metres or 10 seconds in a kilometer race. How long does A take to complete the race?

(1) 200 seconds   (2) 140 seconds

(3) 220 seconds   (4) 190 seconds

Correct Answer - **(4)**

Solution:

A can give B a start of 50 metres or 10 seconds in a 1000 m race.

That is, B takes 10 seconds to run 50 metres.

Therefore, B will take (10/50) * 1000 = 200 seconds to run 1000 metres.

A who can give B a start of 10 seconds will take 10 seconds lesser to run the 1000m.

Hence, the time taken by A = 190 seconds.

Races - Quant/Math - CAT 2008 Question 4 the day: November 10, 2003

The question for the day is from the topic of Races.

A can give B 20 points, A can give C 32 points and B can give C 15 points. How many points make the game?

(1) 150   (2) 200

(3) 100   (4) 170

Correct Answer - (3)

Solution:

Let x points make the game, according to the statement if A has x points. Then B has (x – 20) points

B has x points, then C has (x – 15) points, if C has (x – 32), then A has x points

Hence by chain rule x * x (x – 32) = (x – 20) * (x – 15) * x

x^2 – 32x = x^2 – 35x + 300 => x = 100. Hence 100 points make the game.

Arithmetic Mean Question Answers

Weighted Average - CAT 2007 Math Preparation

Question 4 the day : November 10, 2006
The question for the day is a sample practice problem in Aritbmetic Mean, weighted Average, an Arithmetic Topic and the problem provides an understanding of simple and weighted average.

Question
The average monthly salary of 12 workers and 3 managers in a factory was Rs. 600. When one of the manager whose salary was Rs. 720, was replaced with a new manager, then the average salary of the team went down to 580. What is the salary of the new manager?

1. 570
2. 420
3. 690
4. 640

Correct Answer - **420**. Choice **(2)**

Explanatory Answer

The total salary amount = 15 * 600 = 9000
The salary of the exiting manager = 720.
Therefore, the salary of 12 workers and the remaining 2 managers = 9000 - 720 = 8280

When a new manager joins, the new average salary drops to Rs.580 for the total team of 15 of them.
The total salary for the 15 people i.e., 12 workers, 2 old managers and 1 new manager = 580 *15 = 8700

Therefore, the salary of the new manager is 9000 - 8700 = 300 less than that of the old manager who left the company, which is equal to 720 - 300 = 420.

Another alternate method of doing the problem is as follows:

The average salary dropped by Rs.20 for 15 of them. Therefore, the overall salary has dropped by 15*20 = 300.

Therefore, the new manager's salary should be Rs.300 less than that of the old manager = 720 - 300 = 420.

CAT Sample Questions : Arithmetic Mean

Question 4 the day : June 11, 2004
The question for the day is from the topic average in arithmetic.

Question
The average wages of a worker during a fortnight comprising 15 consecutive working days was Rs.90 per day. During the first 7 days, his average wages was Rs.87/day and the average wages during the last 7 days was Rs.92 /day. What was his wage on the 8th day?

1. 83
2. 92
3. 90
4. 97

Correct Answer - **97**. Choice **(4)** is correct.

Explanatory Answer

The total wages earned during the 15 days that the worker worked = 15 * 90 = Rs. 1350.

The total wages earned during the first 7 days = 7 * 87 = Rs. 609.
The total wages earned during the last 7 days = 7 * 92 = Rs. 644.

Total wages earned during the 15 days = wages during first 7 days + wage on 8th day + wages during the last 7 days.

1350 = 609 + wage on 8th day + 644
wage on 8th day = 1350 - 609 - 644 = Rs.97.

CAT Sample Questions in Math - Averages

Question 4 the day : April 13, 2004
The question for the day is from the topic averages. It is a question based on the concept of simple average

Question
The average of 5 quantities is 6. The average of 3 of them is 8. What is the average of the remaining two numbers?

1. 6.5
2. 4
3. 3
4. 3.5

Correct choice is **(3)** and the Correct Answer is **3**

Explanatory Answer

The average of 5 quantities is 6.
Therefore, the sum of the 5 quantities is 5 * 6 = 30.

The average of three of these 5 quantities is 8.
Therefore, the sum of these three quantities = 3 * 8 = 24

The sum of the remaining two quantities = 30 - 24 = 6.

Average of these two quantities = $\dfrac{6}{2}$ = 3.

Note:
From the answer choices, you can eliminate choice (1) and choice (2) even without solving the question.

As the average of the 5 quantities is 6 and the average of three of these five is 8, the average of the remaining two should be a value that is less than 6. So choice (1) which is more than 6 can be eliminated.

If there were a total of four quantities and the overall average was 6 and the average of 2 of the four were 8, then the average of the remaining two would have been 4. i.e., the simple average of 4 and 8 is 6. However, we have unequal number of quantities. Hence, choice (2) can be eliminated.

Averages, Mean - CAT 2007 Preparation

Question 4 the day : November 12, 2003
The question for the day is a question in Simple Average, Arithmetic Mean - an

Arithmetic Topic and the problem provides an understanding of the different concepts related to Averages.

Question

The average temperature on Wednesday, Thursday and Friday was 25^0. The average temperature on Thursday, Friday and Saturday was 24^0. If the temperature on Saturday was 27^0, what was the temperature on Wednesday?

1. 24^0
2. 21^0
3. 27^0
4. 30^0

Correct Answer is **30^0**. Correct Choice is **(4)**

Explanatory Answer

Total temperature on Wednesday, Thursday and Friday was $25 * 3 = 75^0$

Total temperature on Thursday, Friday and Saturday was $24 * 3 = 72^0$

Hence, difference between the temperature on Wednesday and Saturday = 3^0

If Saturday temperature = 27^0, then Wednesday's temperature = $27 + 3 = 30^0$

Averages, Arithmetic Mean - CAT 2007 Preparation

Question 4 the day : October 21, 2003

The question for the day is a sample practice problem in Simple Average, Arithmetic Mean on change in the average with change in number of elements - an Arithmetic Topic and the problem provides an understanding of the different concepts related to Averages.

Question

The average age of a group of 12 students is 20 years. If 4 more students join the group, the average age increases by 1 year. The average age of the new students is

1. 24
2. 26
3. 26
4. 22

Correct Answer is **24 years**. Correct Choice is **(1)**

Explanatory Answer

Total age of 12 students = 12 * 20 = 240 and the total age of 16 students = 21*16 = 336.

Let the average age of 4 new students be x.

Therefore total age of the new students = 4x.

Hence the total age of 16 students = 240 + 4x = 336 => x = 24

Arithmetic Mean Questions, Answers - CAT 2007 Maths Preparation

Question 4 the day : August 19, 2003
The question for the day is from the topic of Averages. It is a weighted average question and helps understand the basic concepts in averages and weighted average.

Question
When a student weighing 45 kgs left a class, the average weight of the remaining 59 students increased by 200g. What is the average weight of the remaining 59 students?

1. 57
2. 56.8
3. 58.2
4. 52.2

Correct Answer is **57 kgs**. Choice **(1)** is right.

Explanatory Answer

Let the average weight of the 59 students be A.
Therefore, the total weight of the 59 of them will be 59A.

The questions states that when the weight of this student who left is added, the total weight of the class = 59A + 45
When this student is also included, the average weight decreases by 0.2 kgs.
 59A + 45 / 60 = A - 0.2
=> 59A + 45 = 60A - 12
=> 45 + 12 = 60A - 59A
=> A = 57.

Weighted Average Questions : CAT 2007 Online Preparation

Question 4 the day : August 12, 2003
The question for the day is from the topic Averages. It is a question on weighted averages.

Question
Three math classes: X, Y, and Z, take an algebra test.
The average score in class X is 83.

The average score in class Y is 76.
The average score in class Z is 85.
The average score of all students in classes X and Y together is 79.
The average score of all students in classes Y and Z together is 81.

What is the average for all the three classes?

1. 81
2. 81.5
3. 82
4. 84.5

Correct Answer is **81.5**. Choice **(2)** is right.

Explanatory Answer

Average score of class X is 83 and that of class Y is 76 and the combined average of X and Y is 79.

By rule of alligation ratio of students in X : Y is given by
   X   :   Y

         79
        /   \

   83   76

   3   :   4

Similarly, average score of class Y is 76 and that of class Z is 85 and the combined average is 81.

By rule of alligation ratio of students in Y : Z is

   Y   :   Z

            81

         /   \

      76   85

      4   :   5

 X : Y : Z = 3 : 4 : 5

 Total average for X, Y and Z =   (3*83+4*76+5*85) / (3+4+5)

= (249 + 304 + 425) / 12 = 81.5

Averages, Mean - CAT 2007

Question 4 the day : July 16, 2003
The question for the day is a sample practice problem in Simple Average - an Arithmetic Topic and the problem provides an understanding of the different concepts related to Averages.

Question
The average weight of a class of 24 students is 36 years. When the weight of the teacher is also included, the average weight increases by 1kg. What is the weight of the teacher?

1. 60 kgs
2. 61 kgs
3. 37 kgs
4. None of these

Correct Answer - **61 kgs**. Correct Choice is **(2)**

Explanatory Answer

The average weight of a class of 24 students = 36 kgs.

Therefore, the total weight of the class = 24 * 36 = 864 kgs

When the weight of the teacher is included, there are 25 individuals.

The average weight increases by 1kg. That is the new average weight = 37 kgs.

Therefore, the total weight of the 24 students plus the teacher = 25 * 37 = 925

Weight of the teacher = Weight of 24 students + teacher - weight of 24 students

= 925 - 864 = 61 kgs.

Averages Practice Questions : CAT 2007 Quant Preparation

Question 4 the day : June 26, 2003
The question for the day is from the topic Averages. It is a question on simple average.

Question
The average of 5 quantities is 10 and the average of 3 of them is 9. What is the average of the remaining 2?

1. 11
2. 12
3. 11.5
4. 12.5

Correct Answer is **11.5**. Choice **(3)** is right.

Explanatory Answer

The average of 5 quantities is 10.
Therefore, the sum of all 5 quantities is 50.

The average of 3 of them is 9.
Therefore, the sum of the 3 quantities is 27.

Therefore, the sum of the remaining two quantities = 50 - 27 = 23.
Hence, the average of the 2 quantities = 23/2 = 11.5.

Averages, Mean - CAT 2007

Question 4 the day : June 12, 2003
The question for the day is a sample practice problem in Simple Average, Arithmetic Mean - an Arithmetic Topic and the problem provides an understanding of the different concepts related to Averages.

Question
The average age of a family of 5 members is 20 years. If the age of the youngest member be 10 years then what was the average age of the family at the time of the birth of the youngest member?

1. 13.5
2. 14
3. 15
4. 12.5

Correct Answer is **12.5**. Correct Choice is **(4)**

Explanatory Answer

At present the total age of the family = 5 * 20 = 100

The total age of the family at the time of the birth of the youngest member = [100-10-(10*4)] = 50

Therefore, average age of the family at the time of birth of the youngest member = 50/4 = 12.5.

Averages Questions Answers - CAT 2007 Online Preparation

Question 4 the day : March 27, 2003

The question for the day is from the topic Averages. The question is a **CAT 2002** question.

Question

A student finds the average of 10 positive integers. Each integer contains two digits. By mistake, the boy interchanges the digits of one number say ba for ab. Due to this, the average becomes 1.8 less than the previous one. What was the difference of the two digits a and b?

1. 8
2. 6
3. 2
4. 4

Correct Answer - **2**. Choice **(3)** is right.

Explanatory Answer

Let the original number be ab i.e., (10a + b).
After interchanging the digits, the new number becomes ba i.e., (10b + a).

The question states that the average of 10 numbers has become 1.8 less than the original average. Therefore, the sum of the original 10 numbers will be 10*1.8 more than the sum of the 10 numbers with the digits interchanged.

i.e., 10a + b = 10b + a + 18, 9a - 9b = 18, a - b = 2.

Averages questions, answers: CAT 2007 Quant Preparation

Question 4 the day: March 06, 2003

The question for the day is from the topic Averages.

Question

Average cost of 5 apples and 4 mangoes is Rs. 36. The average cost of 7 apples and 8 mangoes is Rs. 48. Find the total cost of 24 apples and 24 mangoes.

1. 1044
2. 2088
3. 720

4. 324

Correct Answer is **2088**. Choice **(2)** is right.

Explanatory Answer

Average cost of 5 apples and 4 mangoes = Rs. 36
Total cost = 36 * 9 = 324

Average cost of 7 apples and 8 mangoes = 48
Total cost = 48 * 15 = 720

Total cost of 12 apples and 12 mangoes = 324 + 720 = 1044
Therefore, cost of 24 apples and 24 mangoes = 1044 * 2 = 2088

Ratio and Proportions - Quant/Math - CAT 2008

Question 4 the day: June 3, 2002
The question for the day is from Ratio and Proportions.

Rs.432 is divided amongst three workers A, B and C such that 8 times A's share is equal to 12 times B's share which is equal to 6 times C's share. How much did A get?

(1) Rs.192   (2) Rs.133   (3) Rs.144   (4) Rs.128

Correct Answer - (3)

Solution:

8 times A's share = 12 times B's share = 6 times C's share.
Note that this is not the same as the ratio of their wages being 8 : 12 : 6

In this case, find out the L.C.M of 8, 12 and 6 and divide the L.C.M by each of the above numbers to get the ratio of their respective shares.

The L.C.M of 8, 12 and 6 is 24.
Therefore, the ratio A:B:C :: 24/8 : 24/12 : 24/6=> A : B : C :: 3 : 2 : 4

The sum of the total wages = 3x + 2x + 4x = 432 => 9x = 432 or x = 48.
Hence A gets 3 * 48 = Rs. 144.

Ratio and Proportions - Quant/Math - CAT 2008

Question 4 the day: June 7, 2002
The question for the day is from the topi Ratio and Proportions.

If 20 men or 24 women or 40 boys can do a job in 12 days working for 8 hours a day, how many men working with 6 women and 2 boys take to do a job four times as big working for 5 hours a day for 12 days?

(1) 8 men   (2) 12 men   (3) 2 men   (4) 24 men

Correct Answer - (3)

Solution:

Amount of work done by 20 men = 24 men = 40 boys or 1 man = 1.2 woman = 2 boys.

Let us therefore, find out the amount of men required, if only men were working on the job, to complete the new job under the new conditions and then make adjustments for the women and children working with the men.

The man hours required to complete the new job = 4 times the man hours required to complete the old job. (As the new job is 4 times as big as the old job)
Let 'n' be the number of men required.

20 * 12 * 8 = n * 5 * 12 * 4. n = 8.

8 men working will be able to complete the given job.

However, the problem states that 6 women and 2 boys are working on the job.
6 women = 6/12= 5 men and 2 boys = 1 man. The equivalent of 5 + 1 = 6 men are already working.

Therefore, 2 men a required to work with 6 women and 2 boys to complete the job.

Ratio and Proportion - Quant/Math - CAT 2008

Question 4 the day: July 11, 2002
The question for the day is the from the topic - Ratio and Proportion.

> Two cogged wheels of which one has 32 cogs and other 54 cogs, work into each other. If the latter turns 80 times in three quarters of a minute, how often does the other turn in 8 seconds?
>
> (1) 48   (2) 135   (3) 24   (4) None of these

Correct Answer - (3)

Solution:

Less Cogs => more turns and less time => less turns

	cogs	time	turns
A	54	45	80
B	32	8	?

Number of turns required = 80 * 54/32 * 8/45= 24 times

Ratio and Proportion - Quant/Math - CAT 2003

Question 4 the day: February 4, 2003

The question for the day is from the topic of Ratio and Proportion.

> The monthly incomes of A and B are in the ratio 4 : 5, their expenses are in the ratio 5 : 6. If 'A' saves Rs.25 per month and 'B' saves Rs.50 per month, what are their respective incomes?
>
> (1) Rs.400 and Rs.500   (2) Rs.240 and Rs.300
>
> (3) Rs.320 and Rs.400   (4) Rs.440 and Rs.550

Correct Answer - (1)

Solution:

Solution

Let A's income be = 4x
A's expenses, therefore = 4x - 25

Let B's income be = 5x
B's expenses, therefore = 5x - 50

We know that the ratio of their expenses = 5 : 6
=> 24x - 150 = 25x - 250
=> Therefore, x = 100.
=> A's income = 4x = 400 and B's income = 5x = 500.

Ratio & Proportion - Quant/Math - CAT 2008 Question 4 the day: February 17, 2003

The question for the day is from the topic of Ratio and Proportion.

The proportion of milk and water in 3 samples is 2:1, 3:2 and 5:3. A mixture comprising of equal quantities of all 3 samples is made. The proportion of milk and water in the mixture is

(1) 2:1   (2) 5:1

(3) 99:61   (4) 227:133

Correct Answer - (4)

Solution:

Proportion of milk in 3 samples is 2/3, 3/5, 5/8.

Proportion of water in 3 samples is 1/3, 2/5, 3/8.

Since equal quantities are taken,

Total proportion of milk is 2/3 + 3/5 + 5/8 = 227/120

Total proportion of water is 1/3 + 2/5 + 3/8 = 133/120

Proportion of milk and water in the solution is = 227:133

So Choice (4) is the right answer.

Ratio and Proportion - Quant/Math - CAT 2008
Question 4 the day: March 26, 2003

The question for the day is from the topic of Ratio and Proportion
> A group of workers can do a piece of work in 24 days. However as 7 of them were absent it took 30 days to complete the work. How many people actually worked on the job to complete it?

> (1) 35   (2) 30

> (3) 28   (4) 42

Correct Answer - **(3)**

Solution:

Let the original number of workers in the group be 'x'

Therefore, actual number of workers = x-7.

We know that the number of manhours required to do the job is the same in both the cases.

Therefore, x (24) = (x-7).30

24x = 30x - 210

6x = 210

x = 35.

Therfore, the actual number of workers who worked to complete the job = x - 7 = 35 -7 = 28.

Ratio and Proportion - Quant/Math - CAT 2008
Question 4 the day: March 31, 2003

The question for the day is from the topic of Ratio and Proportion.
> A, B and C play cricket. A's runs are to B's runs and B's runs are to C's as 3:2. They get altogether 342 runs. How many runs did A make?

(1) 162   (2) 108

(3) 72   (4) None of these

Correct Answer - **(1)**

Solution:

A:B = 3:2 = 9:6;

B:C = 3:2 = 6:4 (making B equal)

Therefore, A:B:C = 9:6:4

Therefore, the runs made by A = (9/19) X 342 = 162.

Ratio and Proportion - Quant/Math - CAT 2008
Question 4 the day: April 16, 2003

The question for the day is from the topic of Ratio and Proportion.
The monthly salaries of two persons are in the ratio of 4:7. If each receives an increase of Rs.25 in the salary, the ratio is altered to 3: 5. Find their respective salaries.

(1) 120 & 210   (2) 80 & 140

(3) 180 & 300   (4) 200 & 350

Correct Answer - **(4)**

Solution:

Let the salaries be 4x and 7x

Therefore, (4x + 25) / (7x + 25) = 3/5

5(4x + 25) = 3(7x + 25)

20x + 125 = 21x + 75

x = 50

Therefore, their salaries are 4(50) & 7(50) i.e., 200 & 350

Ratio and Proportion - Quant/Math - CAT 2008
Question 4 the day: May 16, 2003

The question for the day is from the topic of Ratio and Proportion.
A fort has provisions for 60 days. If after 15 days 500 men strengthen them and the food lasts 40 days longer, how many men are there in the fort?

(1) 3500   (2) 4000

(3) 6000   (4) None of these

Correct Answer - **(2)**

Solution:

Let there be 'x' men in the beginning so that after 15 days the food for them is left for 45 days.

After adding 500 men the food lasts for only 40 days.

Now (x+500) men can have the same food for 40 days.

Therefore by equating the amount of food we get,

45 * x = (x + 500) * 40

45x = (x+500) * 40

5x = 20,000

x = 4,000

Therefore there are 4,000 men in the fort.

Ratio and Proportion - Quant/Math - CAT 2008
Question 4 the day: May 26, 2003

The question for the day is from the topic of Ratio and Proportion.
The ratio of marks obtained by vinod and Basu is 6:5. If the combined average of their percentage is 68.75 and their sum of the marks is 275, find the total marks for which exam was conducted.

(1) 150   (2) 200

(3) 400   (4) None of these.

Correct Answer - **(2)**

Solution:

Let Vinod marks be 6x and Basu's is 5x. Therefore, the sum of the marks = 6x + 5x = 11x.

But the sum of the marks is given as 275 = 11x. We get x = 25 therefore, vinod marks is 6x = 150 and Basu marks = 5x = 125.

Therefore, the combined average of their marks = (150 + 125) / 2 = 137.5.

If the total mark of the exam is 100 then their combined average of their percentage is 68.75

Therefore, if their combined average of their percentage is 137.5 then the total marks would be (137.5 / 68.75)*100 = 200.

Ratio and Proportion - Quant/Math - CAT 2008
Question 4 the day: October 22, 2003

The question for the day is from the topic of Ratio and Proportion.
The present ages of A and B are as 6 : 4. Five years ago their ages were in the ratio 5 : 3. Find their present ages.

(1) 42, 28   (2) 36, 24

(3) 30, 20   (4) 25, 15

Correct Answer - **(3)**

Solution:

Go from the choices

Choice (3) 30 and 20 are in the ratio of 6: 4

Five years ago their ages would be 25 and 15 which are in the ratio 5 : 3.

Hence choice (3) is the right answer.

Ratio and Proportion - Quant/Math - CAT 2008
Question 4 the day: November 11, 2003

The question for the day is from the topic of Ratio and Proportion.

A, B and C enter into a partnership by investing Rs.3600, Rs.4400 and Rs.2800. A is a working partner and gets a fourth of the profit for his services and the remaining profit is divided amongst the three in the rate of their investments. What is the amount of profit that B gets if A gets a total of Rs. 8000?

    (1) 4888.88   (2) 9333.33

    (3) 4000   (4) 3666.66

Correct Answer - **(1)**

Solution:

Let x be the profit.

Their investment ratio = 3600: 4400: 2800 = 9 : 11 : 7

A's profit of Rs. 8000 = (1/4 * x) + 1/3(3/4*x) = 1/2 * x

x = Rs. 16,000

Therefore B's profit = 11/27(3/4 * 16000) = Rs. 4888.88

Ratio Proportion. Quant/Math - CAT 2008
Question 4 the day: March 18, 2004

The question for the day is from the topic ratio proportion.

A, B and C, each of them working alone can complete a job in 6, 8 and 12 days respectively. If all three of them work together to complete a job and earn Rs.2340, what ill be C's share of the earnings?

    (1) Rs.520   (2) Rs.1080

    (3) Rs.1170   (4) Rs.630

Correct choice - (1) Correct Answer -(Rs.520)

Solution:

A, B and C will share the amount of Rs. 2340 in the ratio of the amounts of work

done by them.

As A takes 6 days to complete the job, if A works alone, A will be able to complete 1/6 th of the work in a day.

Similarly, B will complete 1/8 th and C will complete 1/12 th of the work.

So, the ratio of the work done by A : B : C when they work together will be equal to 1/6 : 1/8 : 1/12

Multiplying the numerator of all 3 fractions by 24, the LCM of 6, 8 and 12 will not change the relative values of the three values.

We get24/6 : 24/8 : 24/12 = 4 : 3 : 2.
i.e., the ratio in which A: B : C will share Rs.2340 will be 4 : 3 : 2.

Hence, C's share will be 2/9 * 2340= Rs.520.

Mixtures & Allegations Questions

Mixtures and Allegations - Quant/Math - CAT 2008

Question 4 the day: September 06, 2002
The question for the day is from the topic of Mixtures and Allegations.

How many litres of water should be added to a 30 litre mixture of milk and water containing milk and water in the ratio of 7 : 3 such that the resultant mixture has 40% water in it?

(1) 7 litres   (2) 10 litres   (3) 5 litres   (4) None of these

Correct Answer - **(3)**

Solution:

30 litres of the mixture has milk and water in the ratio 7 : 3. i.e. the solution has 21 litres of milk and 9 litres of water.

When you add more water, the amount of milk in the mixture remains constant at 21 litres. In the first case, before addition of further water, 21 litres of milk accounts for 70% by volume. After water is added, the new mixture contains 60% milk and 40% water.

Therefore, the 21 litres of milk accounts for 60% by volume.

Hence, 100% volume = 21/0.6= 35 litres.

We started with 30 litres and ended up with 35 litres. Therefore, 5 litres of water was added.

Mixtures and Alligation - Quant/Math - CAT 2008

Question 4 the day: October 11, 2002
The question for the day is from the topic of Mixtures and Alligation.

How many kgs of Basmati rice costing Rs.42/kg should a shopkeeper mix with 25 kgs of ordinary rice costing Rs.24 per kg so that he makes a profit of 25% on selling the mixture at Rs.40/kg?

(1) 20 kgs   (2) 12.5 kgs   (3) 16 kgs   (4) 200 kgs

Correct Answer - **(1)**

Solution:

Let the amount of Basmati rice being mixed be x kgs. As the trader makes 25% profit by selling the mixture at Rs.40/kg, his cost /kg of the mixture = Rs.32/kg.

i.e. (x * 42) + (25 * 24) = 32 (x + 25)
=> 42x + 600 = 32x + 800
=> 10x = 200 or x = 20 kgs.

Mixtures and Alligations - Quant/Math - CAT 2008
Question 4 the day: June 16, 2003

The question for the day is from the topic of Mixtures and Alligations.

How many litres of a 12 litre mixture containing milk and water in the ratio of 2 : 3 be replaced with pure milk so that the resultant mixture contains milk and water in equal proportion?

(1) 4 litres   (2) 2 litres

(3) 1 litre   (4) 1.5 litres

Correct Answer - **(2)**

Solution:

The mixture contains 40% milk and 60% water in it. That is 4.8 litres of milk and 7.2 litres of water.

Now we are replacing the mixture with pure milk so that the amount of milk and water in the mixture is 50% and 50%.That is we will end up with 6 litres of milk and 6 litres of water.

Water gets reduced by 1.2 litres.

To remove 1.2 litres of water from the original mixture containing 60% water, we need to remove 1.2 / 0.6 litres of the mixture = 2litres.

Mixtures - Quant/Math - CAT 2008
Question 4 the day: July 07, 2003

The question for the day is from the topic Mixtures.

A sample of x litres from a container having a 60 litre mixture of milk and water containing milk and water in the ratio of 2 : 3 is replaced with pure milk so that the container will have milk and water in equal proportions. What is the value of x?

(1) 6 litres   (2) 10 litres

(3) 30 litres   (4) None of these

Correct Answer - **(2)**

Solution:

The best way to solve this problem is to go from the answer choices.

The mixture of 60 litres has in it 24 litres of milk and 36 litres of water. (2 : 3 :: milk : water)
When you remove x litres from it, you will remove 0.4 x litres of milk and 0.6 x litres of water from it.

Take choice (2). According to this choice, x = 10.

So, when one removes, 10 litres of the mixture, one is removing 4 litres of milk and 6 litres of water.

Therefore, there will be 20 litres of milk and 30 litres of water in the container.

Now, when you add 10 litres of milk, you will have 30 litres of milk and 30 litres of water – i.e. milk and water are in equal proportion.

Mixtures and Alligation - Quant/Math - CAT 2008
Question 4 the day: August 06, 2003

The question for the day is from the topic of Mixtures and Alligation.

A zookeeper counted the heads of the animals in a zoo and found it to be 80. When he counted the legs of the animals he found it to be 260. If the zoo had either pigeons or horses, how many horses were there in the zoo?

(1) 40   (2) 30

(3) 50   (4) 60

Correct Answer - **(3)**

Solution:

Let the number of horses = x

Then the number of pigeons = 80 – x.

Each pigeon has 2 legs and each horse has 4 legs.

Therefore, total number of legs = 4x + 2(80-x) = 260

=>4x + 160 – 2x = 260

=>2x = 100

=>x = 50.

Mixtures and Alligations - Quant/Math - CAT 2008
Question 4 the day: July 4, 2002

In what ratio must a person mix three kinds of tea costing Rs.60/kg, Rs.75/kg and Rs.100 /kg so that the resultant mixture when sold at Rs.96/kg yields a profit of 20%?

(1) 1 : 2 : 4   (2) 3 : 7 : 6   (3) 1 : 4 : 2   (4) None of these

Correct Answer - **(3)**

Solution:

The resultant mixture is sold at a profit of 20% at Rs.96/kg
i.e. 1.2 (cost) = Rs.96 => Cost = 96/1.2 = Rs.80 / kg.
Let the three varities be A, B, and C costing Rs.60, Rs.75 and Rs.100 respectively.
The mean price falls between B and C.

Hence the following method should be used to find the ratio in which they should be mixed.
Step 1. Find out the ratio of Q_A : Q_C using alligation rule Qa/Qc = 100-80 / 80-60 1/1
Step 2. Find out the ratio of Q_B : Q_C using alligation rule   Qb / Qc = 100-80/80-75 = 4/1
Step 3. Q_C, the resultant ratio of variety c can be found by adding the value of Q_C in

step 1 and step 2 = 1 + 1 = 2.

However, in CAT if you try and solve the problem using the above method, you will end up spending more than 2, and may be 3 minutes on this problem, which is a criminal mismanagement of time.
The best way to solve a problem of this kind in CAT is to go from the answer choices as shown below

The resultant ratio $Q_A : Q_B : Q_C :: 1 : 4 : 2$.

1 kg of variety A at Rs.60 is mixed with 4 kgs of variety B at Rs.75 and 2 kgs of variety C at Rs.100.
The total cost for the 7 kgs = 60 + (4 * 75) + (2 * 100) = 60 +300 + 200 = 560.
Cost per kg of the mixture = 560/7 = 80 kgs.

Even assuming that you hit upon the right answer as the last choice, you will still be better of going back from the answer

Mixtures and Alligations - Quant/Math - CAT 2008

Question 4 the day: August 19, 2002
The question for the day is from the topic of Mixtures and Alligations.

A merchant mixes three varieties of rice costing Rs.20/kg, Rs.24/kg and Rs.30/kg and sells the mixture at a profit of 20% at Rs.30 / kg. How many kgs of the second variety will be in the mixture if 2 kgs of the third variety is there in the mixture?

(1) 1 kg   (2) 5 kgs   (3) 3 kgs   (4) 6 kgs

Correct Answer - **(2)**

Solution:

If the selling price of mixture is Rs.30/kg and the merchant makes a profit of 20%, then the cost price of the mixture = 30/1.2 = Rs.25/kg.

We need to find out the ratio in which the three varieties are mixed to obtain a mixture costing Rs.25 /kg.
Let variety A cost Rs.20/kg, variety B cost Rs.24 / kg and variety C cost Rs.30/kg.
The mean desired price falls between B and C.
Step 1: Find out the ratio QA : QC using alligation rule. Qa / Qc = 30-25 / 25-20 =1/1

Step 2: Find out the ratio QB : QC using alligation rule.   Qb / Qc = 30-25 / 25-24
=5/1
Step 3: QC is found by adding the value of QC in step 1 and step 2 = 1 + 1 = 2
Therefore, the required ratio = 1 : 5 : 2
If there are 2 kgs of the third variety in the mixture, then there will be 5 kgs of the
second variety in the mixture.

Note: This is a problem to be skipped, at least in the first go. If you were able to
solve at least 30 other problems in quant, then you should look at this problem.

Quantitative General Questionbank - CAT 2007 Sample Questions

Q. The annual salary of a person in the year2000 is 20% more than that of the year
1999.His annual salary is increased by Rs.36,000 in the year 2001 over that of the
year 2,000.If the increase in the annual salary of the person in the year 2002 over
the year 2001 is 5 percentage points less than the increase in year 2001 over year
2000,and his annual salary in the year 2002 is Rs.2,16,000,then what was his salary
in the year 1999?

A. Rs.1,00,000

B. Rs.1,20,000

C. Rs.1,25,000

D. Cannot be determined   ans: D

Q. Steve Warne captained his team in 120 one day cricket matches with a success
rate of 75%.For the first m matches,his success rate was 70%,55% for the next n
matches and 90% for the last p matches.How many matches did he win in the first
m + n matches he captained?

A. 30

B. 36

C. 45

D. Cannot be determined   ans: B

Q. The volume of a cubiod increase by 40.4%.The total length of all the edges is
increased by 20% and the lateral surface area is increased by 13.4%.What is the
percentage increase/decrease in the height of the cubiod,if the ratio of
length,breadth and height is 3 : 2 : 1?

A. 10% increase

B. 10% decrease

C. 20% increase

D. 20% decrease   ans: B

Q. Three times a number is 20% more than twice another number when increased
by 105.If twice the first number increased by 36 is 20% less than three times of the
second number,then what is the first number?

A. 150
B. 162
C. 180
D. None of these   ans: B

Q. In the year 2001,XYZ motors sold 50%,20%,30% of the total motorcycles sold in that year in the first 3 months,next 4 months and last 5 months respectively.In the year 2002,the increase in the number of motorcycles sold in the first 7 months is 40% over the same period of the previous year and increase in the number of motorcycles sold in the last 9 months is 20% over the corresponding period of the previous year.What is the minimum percentage increase in the number of motorcycles sold in year 2002 over 2001 if the increase in the number of motorcycles sold from April 2002 to July 2002 over the same 4 months of the previous year is not more than 100%?
A. 18%
B. 38%
C. 58%
D. None of these   ans: A

Q. A,B and C contest an election from a particular constituency.A and B together got 50% more votes than C.The vote share of A and C together is 30 percentage points more than the vote share of B.Who won the election?
A. A
B. B
C. C
D. Cannot be determined   ans: C

Q. P,Q and R scored 36%,41% and 51% respectively in a test.R passed the test and Q failed the test.If one of them failed by 21 marks and R passed by 39 marks,then what is the total marks in the test?
A. 1,200
B. 600
C. 400
D. Cannot be determined   ans: D

Q. A,B and C scored 28%,36% and 53% in an examination respectively.B and C passed the examination but A failed.One of them passed by 33 marks and A failed by 17 marks.What is the pass mark in the examination?
A. 192
B. 73
C. 175
D. Cannot be determined   ans: A

Q. A man divides Rs.9,000 into 3 unequal parts and invests them at 5%,6% and 8% per annum.At the end of one year he receives an interest of Rs.580 on his total investment.If he receives equal interest from two of his investments,how much did he invest at 6%,which is more than the investment at 5%?

A. Rs. 3,500

B. Rs. 4,000

C. Rs. 3,000

D. Cannot be determined   ans: B

Q. Instead of increasing the salary of a salesman twice successively by 20%,the employer has given a one-time 40% hike.What is the loss or gain for the employee if his original salary was Rs.1,000?

A. Rs. 4 gain

B. Rs. 40 loss

C. Rs. 40 gain

D. No loss,no gain   ans: B

Q. The salary of a salesman is first increased twice succesively by 15% and then decreased twice successively by 15%.What is the approximate effective change in his original salary?

A. 10% increase

B. 5% decrease

C. 19% decrease

D. 25% increase   ans: B

Q. in a city,20% of the total population is the student community,which is not employed.Of the remaining,56.25% are employed.If the number of non-students who are unemployed is 14,000,then find the population of the city.

A. 56,000

B. 70,000

C. 40,000

D. 60,000   ans: C

Q. Three candidates A,B and C contest an assembly seat.A got as many more votes than B as B got more than C.If A won the election by a majority of 28,000 votes and C got 52,000 votes.find the percentage of votes polled to A.9All the votes polled are valid).

A. 45%

B. 36%

C. 33.33%

D. Data insufficient   ans: A

Q. Some articles were sold at a certain sellingprice.When the price of each article

was increased by 20%,the revenue from the sales decreased by 10% and became Rs.2,160.If the new price of each article is Rs.36 then find the number of articles sold at the original price.

A. 75

B. 80

C. 60

D. 90   ans: B

Q. Out of four numbers,the second and the third numbers respectively are 50% and 150% more than the first number.If the fourth number is 25 more than the third number and five times the first number,then by what percentage is the scond number less than the fourth number?

A. 38.46%

B. 70%

C. 60%

D. 41.66%   ans: B

----

1. Some work is done by two people in 24 minutes. One of them can do this work alone in 40 minutes. How much time does the second person take to do the same work ?

Ans. 60 minutes

2. A car is filled with four and half gallons of fuel for a round trip.If the amount of fuel taken while going is 1/4 more than the amount taken for coming, what is the amount of fuel consumed while coming back?

Ans.2 gallons

3. The lowest temperature in the night in a city A is 1/3 more than 1/2 the highest during the day. Sum of the lowest temperature and the highest temperature is 100 degrees. Then what is the low temp?

Ans.40 degrees

4. Javagal, who decided to go to weekened trip should not exceed 8 hours driving in a day. The average speed of forward journey is 40 miles/hr.Due to traffic on sundays, the return journey's average speed is 30 m/h. How far he can select a picnic spot?

a) 120 miles
b) between 120 and 140 miles
c) 160 miles

Ans. 120 miles

5. A salesperson by mistake multiplied a number and got the answer as 3, instead of dividing the number by 3.What is the answer he should have actually got?

Ans. 3

6. A building with height D shadow upto G. What is the height of a neighbouring building with a shadow of C feet.

Ans. (C*D)/G

7. A person was fined for exceeding the speed limit by 10 mph. Another person was also fined for exceeding the same speed limit by twice the same. If the second person was travelling at a speed of 35 mph, find the speed limit.

Ans. 15 mph

8. A bus started from bustand at 8.00am, and after staying for 30 minutes at a destination, it returned back to the busstand. The destination is 27 miles from the busstand. The speed of the bus is 18mph. During the return journey bus travels with 50% faster speed.At what time does it return to the busstand?

Ans. 11.00am

9. In a mixture, R is 2 parts and S is 1 part. In order to make S to 25% of the mixture, how much of R is to be added?

Ans.One part of R

10. Wind flows 160 miles in 330 min, for travelling 80 miles how much time does it require?

Ans. 2 hrs 45 mins

11. With a 4/5 full tank a vehicle can travel 12 miles, how far can it travel with a 1/3 full tank

Ans. 5 miles

12. There are two trees in a lawn. One grows at a rate 3/5 of the other in 4 years. If the total growth of trees is 8 ft. What is the height of the smaller tree after 2 years

Ans. 1 1/2 feet

13. Refer to the figure below.A ship started from P and moves at a speed of I miles per hour and another ship starts from L and moving with H miles per hour simultaneously.Where do the two ships meet?

||---g---||---h---||---i---||---j---||---k---||---l---||

PG H I J K L are the various stops in between denoted by || . The values g, h, i, j, k, l denote the distance between the ports.

Ans. Between I and J, closer to J

14. If A is travelling at 72 km per hour on a highway. B is travelling at a speed of 25 meters per second on a highway. What is the difference in their speeds in m/sec.

Ans. 1 m/sec

15. What is the percentage represented by 0.03 * 0.05 ?

(a)0.0015
(b)0.000015
(c)0.15
(d)15

Ans.B

16. (x-a)(x-b)(x-c)....(x-z) = ?

(a)   1
(b) -1
(c)   0
(d) Can't be determined

Ans. C

17. If a = 1, b = 2, c = 3.......z = 26 what is the value of p+q+r ?

(a)33
(b)51
(c)52
(d)48

Ans. B

18. A is 8 miles east of B.
   C is 10 miles north of B.
   D is 13 miles east of C and E is 2 miles north of D.
   Find shortest distance between A and E.

(a) 5 miles
(b) 6miles
(c) 13 miles
(d) 18 miles

Ans. C

19. If z = 1, y = 2.......a = 26. Find the value of **z + y + x + …….+a.**

(a) 351
(b) 221
(c) 400
(d) 200

Ans. A

20. There are 30 socks in a bag.
   Out of these 60 % are green and the rest are blue.
   What is the maximum number of times that socks have to be taken out so that
atleast 1 blue pair is found.

(a) 21
(b) 2
(c)18
(d) 20

Ans. D

21. How many two digit numbers have their square ending with 8.

(a) 13
(b) 12

(c) 0
(d) 11

Ans. C

22. How many numbers are there between 100 and 300 with 2 in the end and 2 in the beginning.

(a) 10
(b) 9
(c) 11
(d) none of these

Ans. A

23. 0.000006 * 0.0000007 = ?

(a) 0.0000000042
(b) 0.000000000042
(c) 0.0000000000042
(d) 0.00000000000042

Ans. B

24. You have Rs 1000 with 8% p.a compounded every 6 months.
    What is the total interest you get after 1 year.

(a) Rs.116.40
(b) Rs.345.60
(c) Rs.224.50
(d) Rs.160

Ans. A

25. If x + y =12,
        x - y = 2
    Find x + 2y.

(a) 12
(b) 17
(c) 14
(d) none of these

Ans. B

26. With one gallon of petrol a person moves at a speed of 50 mph and covers 16 miles.
    3/4th of the distance is covered while moving at 60 mph.
    How many gallons does he need to cover 120 miles in 60 mph.

27. A tap drains at x speed while tap B is closed.
    When both taps are open they drain at y speed.
    What is the speed of draining when only tap B is open

(a) x - y
(b) y-x
(c) x
(d) can't be determined

Ans. B

28. What is twenty percent of 25 % of 20.

(a) 2
(b)1
(c) 5
(d) 4

Ans. B

29. A rectangle has the dimensions 6ft * 4ft.
    How many squares of 0.5 inches will it need to completely fill it.

(a) 32000
(b) 12824
(c) 13824
(d) 18324

Ans. C

VEDIC MATHEMATICS

Vedic Mathematics is the name given to the ancient system of Mathematics which was discovered from the Vedas between 1911 and 1918 by Sri Bharati Krsna Tirthaji (1884-1960). According to his research all of mathematics is based on sixteen Sutras or word-formulae. For example, 'Vertically and Crosswise` is one of these Sutras. These formulae describe the way the mind naturally works and are therefore a great help in directing the student to the appropriate method of solution.

Perhaps the most striking feature of the Vedic system is its coherence. Instead of a hotch-potch of unrelated techniques the whole system is beautifully interrelated and unified: the general multiplication method, for example, is easily reversed to allow one-line divisions and the simple squaring method can be reversed to give one-line square roots. And these are all easily understood. This unifying quality is very satisfying, it makes mathematics easy and enjoyable and encourages innovation.

In the Vedic system 'difficult' problems or huge sums can often be solved immediately by the Vedic method. These striking and beautiful methods are just a part of a complete system of mathematics which is far more systematic than the modern 'system'. Vedic Mathematics manifests the coherent and unified structure of mathematics and the methods are complementary, direct and easy.

The simplicity of Vedic Mathematics means that calculations can be carried out mentally (though the methods can also be written down). There are many advantages in using a flexible, mental system. Pupils can invent their own methods, they are not limited to the one 'correct' method. This leads to more creative, interested and intelligent pupils.

Interest in the Vedic system is growing in education where mathematics teachers are looking for something better and finding the Vedic system is the answer. Research is being carried out in many areas including the effects of learning Vedic Maths on children; developing new, powerful but easy applications of the Vedic Sutras in geometry, calculus, computing etc.

But the real beauty and effectiveness of Vedic Mathematics cannot be fully appreciated without actually practising the system. One can then see that it is perhaps the most refined and efficient mathematical system possible.

Base Method

This is very suitable when numbers are close to a base like 10, 100, 1000 or so on. Let's take an example:
106×108

Here the base is 100 and the 'surplus' is 6 and 8 for the two numbers. The answer will be found in two parts, the right-hand should have only two digits (because base is 100) and will be the product of the surpluses. Thus, the right-hand part will be 6 × 8, i.e. 48. The left-hand part will be one multiplicand plus the surplus of the other multiplicand. The left part of the answer in this case will be 106 + 8 or for that matter 108 + 6 i.e. 114. The answer is 11448.

12 X 14.

10 would the most suitable base. In the current example, the surplus numbers are +2 and +4.

If 8x7 were to be performed and base of 10 were chosen, then -2 and -3 would have been the deficit numbers.

Try the following numbers

(a) 13 X 16   (b) 16 X 18   (c) 18 X 19   (d) 22 X 24

Once you get comfortable, do not use any paper or pen.

27 X 28 32^2 #9; #9;   23 X 18   46 X 48   5255 58^2

53 X 57 62^2 38^2 42 X 46 #9; #9;   9698   92 X 93

99 X 99 #9; #9;   102 X 105 98 X 107   112X113 108^2 123 X 127

USING   OTHER   BASES

In 46 X 48, the base chosen is 50 and multiplication of 44 by 50 is better done like this: take the half of 44 and put two zeros at the end, because 50 is same as 100/2. Therefore, product will be 2200. It would be lengthy to multiply 44 by 5 and put a zero at the end. In general, whenever we want to multiply anything by 5, simply halve it and put a zero.

Multiply 32 by 25. Most of the students would take 30 as the base. The method is correct but nonetheless lengthier. Better technique is to understand that 25 is same as one-fourth. Therefore, one-fourth of 32 is 8 and hence the answer is 800.

An application of Base Method to learn multiplications of the type 3238, where unit's digit summation is 10 and digits other than unit's digit are same in both the numbers. In the above example, 2 + 8 = 10 and 3 in 32 is same as 3 in 38. Therefore method can be applied. The method is simple to apply. The group of digits other than unit's digit, in this case 3, is multiplied by the number next to itself. Therefore, 3 is multiplied by 4 to obtain 12, which will form the left part of the answer. The unit's digits are multiplied to obtain 16 (in this case), which will form the right part of the answer. Therefore, the answer is 1216.

Try these now

53 X 57   91 X 99   106 X 104   123 X 127

The rule for squares of numbers ending with 5. e.g., 65^2. This is same as 65 X 65 and since this multiplication satisfies the criteria that unit's digit summation is 10 and rest of the numbers are same, we can apply the method. Therefore, the answer is 42 / 25 = 4225.

Try these:

35^2　　　95^2　　　125^2　　　205^2

CUBING

Finding the cubes of numbers close to the powers of 10. e.g., cubes of 998, 1004, 100012, 10007, 996, 9988, etc. Some of the numbers are in surplus and others are in deficit. Explain the method as given below.

Find $(10004)^3$

Step (I) : Base is 10000. Provide three spaces in the answer.The base contains 4 zeros. Hence, the second and third space must contain exactly 4 digits.

　　10 0 0 4 = —/ —/ —

Step (II) : The surplus is (+4). If surplus is written as 'a', perform the operation '3a' and add to the base 10000 to get 10012. Put this in the 1st space.

1 0 0 0 4 = 1 0 0 1 2 /—/—

Step (III) : The new surplus is (+12). Multiply the new surplus by the old surplus, i.e. (+4)(+12) = (+48). According to the rule written in the step (I), 48 is written as 0048.

1 0 0 0 4 = 1 0 0 1 2 / 0 0 4 8 /—

Step (IV) : The last space will be filled by the cube of the old surplus (+4). Therefore, 4^3 = 64, which is written as 0064.

1 0 0 0 4 = 1 0 0 1 2 / 0 0 4 8 / 0 0 6 4

Therefore, the answer is 1001200480064.

Find $(998)^3$

Step (I) : Base = 1000. Hence, exactly 3 digits must be there in the 2nd and 3rd space.The deficit = (+2)

　　　9 9 8 = —/—/—

Step (II) : Multiply the deficit by 3 and subtract (because this is the case of deficit) from the base.

9 9 8 = 9 9 4 /—/—

Step (III) : (old deficit) x (new deficit) = 2 x 6 = 12

9 9 8 = 9 9 4 / 0 1 2 /—

Step (IV) : The cube of the old deficit = 8. Since it is the case of deficit, -8 should be written. All that you need to do to write the negative number in the third space is to find the complement of the number, in this case 8. But since the third space must have exactly 3 digits, the complement of 008 must be calculated. The complement of 008 is 992. Don't forget to reduce the last digit of the second space number by 1

9 9 8 = 9 9 4 / 0 1 2 / 9 9 2

- 1

—————————————

9 9 4 / 0 1 1 / 9 9 2

Therefore, the answer is 994011992

As an exercise, try the following :

99994^3 = 9 9 9 8 2 / 0 0 1 0 8 / 0 0 2 1 6 = 99982/00107/99784

10005^3 = 1 0 0 1 5 / 0 0 7 5 / 0 1 2 5 = 10015/0075/0125

100025^3 = 1 0 0 0 7 5 / 0 1 8 7 5 / 1 5 6 2 5 = 100075/01875/15625

9999988^3 = 9 9 9 9 9 6 4 / 0 0 0 0 4 3 2 / 0 0 0 1 7 2 8

= 9999964/0000431/9998272

CRITICAL REASONING :

CRITICAL REASONING

The critical reasoning section consists of some passages followed by 4 to 7 questions per passage. The questions are such that they require ability to read fast and comprehend. The questions asked in this section have three choices TRUE, FALSE, CAN'T SAY. Some examples of questions are given below. Please note that these passages are not the exact passages asked. The passages used a good deal of

difficult words which have been removed in this reproduction. Also the passages appearing in the actual paper are much lengthier.

Directions: Answer the questions given below the passage or statement as true, false or can't say.

PASSAGE A: My father has no brothers. He has three sisters who has two childs each.

Answer 1-5 based on the passage A

1.My grandfather has two sons .

2. Three of my aunts have two sons

3. My father is only child to his father

4. I have six cousins from my mother side

5. I have one uncle

PASSAGE B: Ether injected into gallablader to dissolve colestrol based gallstones. This type one day treatment is enough for gallstones not for calcium stones. This method is alternative to surgery for millions of people who are suffering from this disease.

Answer questions 6-9 based on passage B

6.Calcium stones can be cured in oneday

 7. Hundreds of people contains calcium stones

8. Surgery is the only treatment to calcium stones

9. Ether will be injected into the gallbleder to cure the cholestrol based gall stones

PASSAGE C: Hacking is illegal entry into another computer. This happens mostly because of lack of knowledge of computer networking. With networks one machine can access to another machine.Hacking go about without knowing that each network is accredited to use network facility.

Answer questions 10-12 based on passage B

10. Hackers never break the code of the company which they work for

11. Hacking is the only vulnerability of the computers for the usage of the data

12.Hacking is done mostly due to the lack of computer knowledge

PASSAGE   C:

Alphine tunnels are closed tunnels.In the past 30 yrs not even a single accident has been recorded for there is one accident in the rail road system. Even in case of a fire accident it is possible to shift the passengers into adjacent wagons and even the live fire can be detected and extinguished with in the duration of 30 min.

Answer questions 13-16 based on passage C

13. No accident can occur in the closed tunnels

14. Fire is allowed to live for 30 min

16. All the care that travel in the tunnels will be carried by rail shutters.

PASSAGE   D:

In the past helicopters were forced to ground or crash because of the formation of the ice on the rotors and engines. A new electronic device has been developed which can detect the watercontent in the atmosphere and warns the pilot if the temperature is below freezing temperature about the formation of the ice on the rotors and wings.

Answer questions 17-20 based on passage D

17.The electronic device can avoid formation of the ice on the wings

18. There will be the malfunction of rotor & engine because of formation of ice

19. The helicopters were to be crashed or grounded

20. There is only one device that warn about the formation of ice

PASSAGE   E:

In the survey conducted in mumbai out of 63 newly married house wives not a single house wife felt that the husbands should take equal part in the household work as they felt they loose their power over their husbands. Inspite of their careers they opt to do the kitchen work themselves after coming back to home. the wives get half as much leisure time as the husbands get at the week ends.

Answer questions 21-23 based on passage E

21.Housewives want the husbands to take part equally in the household

22. Wives have half as much leisure time as the husbands have

23. 39% of the men will work equally in the house in cleaning and washing

PASSAGE   F:

Copernicus is the intelligent. In the days of copernicus the transport and technology development was less & it took place weeks to comunicate a message at that time,wherein we can send it through satellite with in no time.Even with this fast developments it has become difficult to understand each other.

Answer questions 24-27 based on passage F

24. People were not intelligent during Copernicus days

25. Transport facilities are very much improved in noe a days

26. Even with the fast developments of the technology we can't live happily.

27. We can understand the people very much with the development of communication

 PASSAGE G: Senior managers warned the workers that because of the intfoductors of japanese industry in the car market. There is the threat to the workers.They also said that there will be the reduction in the purchase of the sales of car in public.the interest rates of the car will be increased with the loss in demand.

Answer questions 28-31 based on passage G

28. Japanese workers are taking over the jobs of indian industry.

29. Managers said car interests will go down after seeing the raise in interest rates.

30. Japanese investments are ceasing to end in the car industry.

31. People are very interested to buy the cars.

PASSAGE H: In the totalitariturican days,the words have very much devalued.In the present day,they are becoming domestic that is the words will be much more devalued. In that days, the words will be very much effected in political area.but at present,the words came very cheap .We can say they come free at cost.

Answer questions 32-34 based on passage H

32.Totalitarian society words are devalued.

33. Totalitarians will have to come much about words

34. The art totalitatian society the words are used for the political speeches.

PASSAGE I: There should be copyright for all arts. The reele has came that all the arts has come under one copy right society,they were use the money that come from the arts for the developments . There may be a lot of money will come from the Tagore works. We have to ask the benifiters from Tagore work to help for the development of his works.

Answer questions 35-39 based on passage I

35. Tagore works are came under this copy right rule.

36. People are free to go to the public because of the copy right rule.

38. People gives to theater and collect the money for development.

39. We have ask the Tagore residents to help for the developments of art.

Directions for questions 40-45: In each question, a series of letters satisfying a certain pattern are given. Identify the pattern and then find the letter/letters that will come in place of the blank/blanks.

40. a, c, e, g, _

(a) h
(b) i
(c) d
(d) j

41. a, e, i, m, q, u, _, _

(a) y, c
(b) b, f
(c) g, i
(d) none

42. ay , bz , cw , dx ,___

(a) gu
(b) ev
(c) fv
(d) eu

43. 1, 2, 3, 5, 7, 11, ___

(a) 15
(b) 9
(c) 13
(d) 12

44. kp , lo , mn , ___

(a) nm
(b) np
(c) op
(d) pq

45. abc , zyx , def , wvu , ____

(a) ghi
(b) tsr
(c) ihg
(d) str

Directions for questions 46 to 51: Select the alternative that logically follows form the two given statements.

46. All books are pages. All pages are boxes.

(a) All boxes are books
(b) All books are boxes
(c) No books are boxes
(d) Both (a) and (b) are correct

47. No apple is an orange. All bananas are oranges.

(a) All apples are oranges
(b) Some apples are oranges
(c) No apple is a banana
(d) None of the above

48. All pens are elephants. Some elephants are cats.

(a) Some pens are cats
(b) No pens are cats
(c) All pens are cats
(d) None of the above

49. All shares are debentures.No debentures are deposits.

(a) All shares are deposits
(b) Some shares are deposits
(c) No shares are deposits
(d) None of the above

50. Many fathers are brothers. All brothers are priests.

(a) No father is a priest
(b) Many fathers are not priests
(c) Many fathers are priests
(d) Both (b) and (c)

51. Some pens are pencils. All pencils are costly.

(a) No pens are costly
(b) Some pens are costly
(c) All pens are costly
(d) None of the above

1. Ans. False	2. Ans. Can't say	3.Ans. False	4.Ans. Can't say
5.Ans. Can't say(uncle can be from the mother's side as well)	6.Ans. False	7.Ans. Can't say	8.Ans. True
9.Ans. True	10.Ans. Can't say	11.Ans. False	12.Ans. False
13.Ans. True	14.Ans. False		16.Ans.True
17.Ans.False	18.Ans.True	19.Ans.True	20.Ans.True
21.Ans.False	22.Ans. False	23.Ans. False	24.Ans.False
25.Ans.Can't say	26.Ans. Can't say	27.Ans. False.	28.Ans.False
29.Ans.True	30.Ans. False	31.Ans.False	32.Ans.False
33.Ans.True	34.Ans. False	35.Ans. False	36.Ans.Can't say
	38.Ans.Can't say	39.Ans.Can't say	40.Ans. B
41. Ans. A	42.Ans. D	43.Ans. 13 , series of prime numbers	44.Ans. A
45. Ans. A	46.Ans. B	47.Ans. A	48.Ans. D
49.Ans.C	50.Ans. B	51.Ans. B	