Quick Quant Pocket Guide

Pocket mein Rocket

By

MBAtutes.com

A) **A MATHEMATICAL EXPRESSION MAY, SOMETIMES,INVOLVES THE APPLICATION OF ALGEBRAIC FORMULAE. THESE FORMULAE ARE LISTED BELOW:**

1) $(a+b)^2 = a^2 + 2ab + b^2$

2) $(a-b)^2 = a^2 - 2ab + b^2$

3) $(a+b)^3 = a^3 + 3a^2b + 3ab^2 + b^3 = a^3 + b^3 + 3ab\,(a+b)$

4) $(a-b)^3 = a^3 - 3a^2b + 3ab^2 - b^3 = a^3 - b^3 - 3ab\,(a-b)$

5) $(a^2 - b^2) = (a+b)\,(a-b)$

6) $(a^3 + b^3) = (a+b)\,(a^2 - ab + b^2)$

7) $(a^3 - b^3) = (a-b)\,(a^2 + ab + b^2)$

B) **A MATHEMATICAL EXPRESSION MAY, SOMETIMES,INVOLVES THE RULES OF DISTRIBUTION. THESE ARE LISTED BELOW :**

1) $a\,(b+c) = ab + ac$

2) $a(b-c) = ab - bc$

3) $(a+b)\,(c+d) = ac+bc+bd$

4) $\frac{a+b+c}{d} = \frac{a}{d} + \frac{b}{d} + \frac{c}{d}$

C) SQUARES AND CUBES:

No.	Square	Cube
1	1	1
2	4	8
3	9	27
4	16	64
5	25	125
6	36	216
7	49	343
8	64	512
9	81	729
10	100	1000
11	121	1331
12	144	1728
13	169	2197
14	196	2744
15	225	3375

No.	Square
16	256
17	289
18	324
19	361
20	400
21	441
22	484
23	529
24	576
25	625
26	676
27	729
28	784
29	841
30	900

D) TABLES (from 1 to 15) :

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
2	4	6	8	10	12	14	16	18	20	22	24	26	28	30
3	6	9	12	15	18	21	24	27	30	33	36	39	42	45
4	8	12	16	20	24	28	32	36	40	44	48	52	56	60
5	10	15	20	25	30	35	40	45	50	55	60	65	70	75
6	12	18	24	30	36	42	48	54	60	66	72	78	84	90
7	14	21	28	35	42	49	56	63	70	77	84	91	98	105
8	16	24	32	40	48	56	64	72	80	88	96	104	112	120
9	18	27	36	45	54	63	72	81	90	99	108	117	126	135
10	20	30	40	50	60	70	80	90	100	110	120	130	140	150

TABLES (from 16 to 30) :

16	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
32	34	36	38	40	42	44	46	48	50	52	54	56	58	60
48	51	54	57	60	63	66	69	72	75	78	81	84	87	90
64	68	72	76	80	84	88	92	96	100	104	108	112	116	120
80	85	90	95	100	105	110	115	120	125	130	135	140	145	150
96	102	108	114	120	126	132	138	144	150	156	162	168	174	180
112	119	126	133	140	147	154	161	168	175	182	189	196	203	210
128	136	144	152	160	168	176	184	192	200	208	216	224	232	240
144	153	162	171	180	189	198	207	216	225	234	243	252	261	270
160	170	180	190	200	210	220	230	240	250	260	270	280	290	300

E) **COMMONLY-USED CONVERSION OF PERCENTAGES TO FRACTIONS ARE GIVEN BELOW :**

(A) **Dividing 100% into equal 10 equal parts.**

1) $10\% = \frac{1}{10} = 0.1$

2) $20\% = \frac{1}{5} = 0.2$

3) $30\% = \frac{3}{10} = 0.3$

4) $40\% = \frac{2}{5} = 0.4$

5) $50\% = \frac{1}{2} = 0.5$

6) $60\% = \frac{3}{5} = 0.6$

7) $70\% = \frac{7}{10} = 0.7$

8) $80\% = \frac{4}{5} = 0.8$

9) $90\% = \frac{9}{10} = 0.9$

10) $100\% = 1.0$

Sometimes, $5\% = \frac{5}{100} = \frac{1}{20} = 0.05$ is also useful to remember

(B) **Dividing 100% into 6 equal parts.**

1) $16\frac{2}{3}\% = \frac{1}{6}$

2) $33\frac{1}{3}\% = \frac{2}{6} = \frac{1}{3}$

3) $66\frac{2}{3}\% = \frac{4}{6} = \frac{2}{3}$

4) $83\frac{1}{2}\% = \frac{5}{6}$

5) $100\frac{6}{6}\% = 1$

Sometimes, $8\frac{1}{3}\% = \frac{1}{12}$ is our useful to remember.

(C) <u>Dividing 100% into 8 equal parts</u>.

1) $12\frac{1}{2}\% = \frac{1}{8}$

2) $25\% = \frac{2}{8} = \frac{1}{4}$

3) $37\frac{1}{2}\% = \frac{3}{8}$

4) $50\% = \frac{4}{8} = \frac{1}{2}$

5) $62\frac{1}{2}\% = \frac{5}{8}$

6) $75\% = \frac{6}{8} = \frac{3}{4}$

7) $87\frac{1}{2}\% = \frac{7}{8}$

8) $100\% = \frac{8}{8} = 1$

Sometimes, $6\frac{1}{4}\% = \frac{1}{16}$ is also useful to remember.

(D) **<u>Non-conventional percentages</u>**

1) $11\frac{1}{9}\% = \frac{1}{9}$

2) $9\frac{1}{11}\% = \frac{1}{11}$

F) <u>MULTIPLICATION COMMONLY-USED IN COMPETITIVE EXAMINATIONS</u> :

1) 16 × 12 = 192 **2) 15 × 25 = 375** **3) 16 × 25 = 400** **4) 3 × 37 = 111 ***

* : Note that 3 × 37 = 111 →111 ÷37 = 3. Thus, a question based on this relationship may get framed as, say,

$888 \div 37 + 1 = \sqrt{?}$

here, one must be able to perform the division (888 ÷37) as equal to 3 **× 8 = 24,**

Because 888 = 111 × 8 and 111 ÷ 37 = 3.

Thus, the apparently strange(unkown) numbers become friendly (known ones) and the above equation can be solved as:

$\sqrt{?}$ = 24 + 1 = 25. ∴ $? = 25 = 625$.

G) FRACTION – ASCENDING/DESCENDING ORDER :

A given set of fractions can be arranged in ascending / descending order (by value) by application of any of the following methods :

(A) Calculate the decimal value of each and compare.

(B) Make the base equal and compare the numerators.

(C) arrange the given fractions in same order (by judgement) and compare any two of them by cross-multiplication. The same relationship then holds good for the remaining fractions also.

In competitive examinations, method (C) above gives the answer fast while method (A) is the longest ,time wise.

Illustrative Examples :

1. Write the following fractions in ascending order.

$$\frac{13}{19} \ , \ \frac{25}{31} \ , \ \frac{31}{37} \ , \ \frac{19}{25} \ , \ \frac{7}{13}$$

Here, instead of calculating the decimal values of each fractions, we observe that there is some order in the above set. Observe that the difference between the numerator and the denominator numbers is constant(6). We therefore, write these fractions as follows :

$$\frac{7}{13} \ , \ \frac{13}{19} \ , \ \frac{19}{25} \ , \ \frac{25}{31} \ , \ \frac{31}{37}$$

Now, compare any two (consecutive) fraction (say, $\frac{7}{13}$, $\frac{13}{19}$) by **cross-multiplication.**

7 * 19 = 133 and 13*13 =169

Since 133 is less then 169 , we have ,

$\frac{7}{13} < \frac{13}{19}$ same relationship will now hold for the **remaining fraction** as well.

Thus, $\frac{7}{13} < \frac{13}{19} < \frac{19}{25} < \frac{25}{31} < \frac{31}{37}$

(Note that we have not calculated the individual values of the fractions, but have judged the relationship between the fractions).

2. Which of the following fractions is the largest ?

(3/7), (13/17), (15/19), (23/27), (29/33)

Here, observe that the difference between the numerator and denominator of each fraction is the same(4). In such cases, the highest value of the fraction would be for the one which has bigger numbers in Numerator & Denominator. Thus, in this example, the value of the fraction (29/33) would be the largest.

H) UNITS OF MEASUREMENT AND CONVERSION FACTORS :

1. Majority of the units can be visualised from the following :

a) mili

b) centi

c) deci

* d) meter/litre/gram

e) deca

f) hecto

g) kilo

***** The three terms meter/litre/gram denote the unit of measurement of distance, volume and weight respectively.
The table can now be read as follows :

1) For the use of units of distance : millimetre, centimetre, decimetre, meter, decametre, hectometre,kilometre.

2) for the use of the units of volume : militre, centilitre, decilitre,litre,decalitre,hectolitre,kilolitre

3) for the use of units of weight : milligram, centigram, centigram, decigram, gram, decagram, hectogram, kilogram.

Each higher step is obtained by multiplying the earlier (immediately preceding) one by 10. Thus, 1Centimeter = 10 milimeter , 1 litre = 10 × 10 ×10 = 1000 mililitres, 1 kilogram = 10× 10 ×10 = 1000 grams, 1kilogram = 10 × 10 × 10 × 10 × 10 × 10 = 1,000,000 miligrams, etc.

2.Apart from these, various other units can be listed (alongwith their conversion factors) as follows :

1) 1 **foot** = 12 **inches** = 30.48 **milimetres.**

2) 1 **inch** = 24.5 **milimetres** = 2.54 **centimetres.**

3) 1 **fathom** = 6 **feet.**

4) 1 **mile** = 900 **fathoms** = 8 **furlongs** = 1.609 **kilometres.**

5) 1 **yard** = 3 **feet.**

6) 1 **nautical mile** = 1.852 **kms.** ..... used for navigation.

7) 1 **acre** = 4,000 **square metres** = 40 **gunthas** = 43,560 **sq.ft.**

8) 1 **hectare** = 2.5 **acre** = 10,000 **sq.metres.**

9) 1 **quintal** = 100 **kilograms..**

10) 1 **metric ton** = 1,000 **kilograms.**

11) 1 **kilogram** = 2.204 **pounds.**

12) 1 **gallon** = 4.54609 **litres.**

13) 1 **hour** = 60 **minutes** = 3,600 **seconds** (1 **minute** = 60 **seconds**).

14) 1 **degree** = 12 **inches** = 60 **miutes** = 3,600 **seconds** .....angular measurement.

I) TEST OF DIVISIBILITY :

The rules for testing divisibility of a number by 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, and 12 are given below:

A number is divisible by	**if**
2	The last digit is 0, 2, 4, 6 or 8 (an even no.).
3	The sum of all its digit is divisible by 3.
4	The last two digit form a number divisible by 4 or are 00.
5	The last digit is 5 or 0.
6	It is divisible by both 2 and 3.
8	The last three digits form a number divisible by 8 or are 000.
9	The sum of all digits is divisible by 9.
10	The last digit is 0.
11	The difference between the sum of digits at odd and even places is either 0 or in multiples of 11.
12	It is divisible by both 3 and 4.