Sample Paper
Class – X
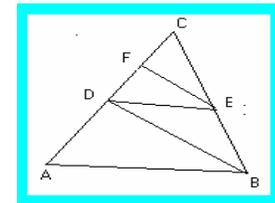## Subject – Mathematics

<u>Section – A</u>
(Answer all the questions from this Section)

1.a) A certain sum gives Rs 1000 as SI and 1050 as CI for 2 years time . If
the rate is same , find the sum   (3)

b) What   are the solutions to $|x| \geq 2$? .
Graph on a number line.   (3)

c) $n = \dfrac{\sqrt{x^2+xy} + \sqrt{x^2-xy}}{\sqrt{x^2+xy} - \sqrt{x^2-xy}}$,   show that $n^2 y - 2nx + y = 0$ (4)

2   a) DE || AB and
FE || DB   Prove that   DC² = CF.AC (3)

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b). Four horses are tethered at 4 corners of a square field of side 70 metres
so that they just cannot reach one another. What is the area left ungrazed
by the horses   4

c) Mr. Khan invests Rs. 45000 in a cement company paying a dividend
of 9% per annum, when Rs. 100 share sells at Rs. 150. What is his annual

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Income? He sells 50% o his shares when the price rises to Rs. 200. What is his gain ?

3 a) A hemispherical bowl of internal diameter 36 cm is full of some liquid. This liquid is to be filled in cylindrical bottles of radius 3 cm and height 6 cm. Find the number of bottles needed to empty the bowl   3

b) Bibhu Prasad buys goods worth Rs. 5000. He gets a rebate of 5% on it. A sales tax at the rate o 5% is levied on the discounted price. Find the amount he will have to pay or the goods.:   (3)

c) A sum of Rs.4,920 was borrowed at 5% p.a. compound interest. The loan was paid back in 2 equal instalments in two years. Find the value of each instalment.   (4)

4 a) If the point C (—1, 2) divides the line segment AB in the ratio 3 : 4, where coordinates of A are (2, 5), find the coordinates of B. \   (3)

   b) Given that $2x^3 - x^2 - 2x + 3 = (Ax + B)(x - 1)(x + 2) + C(x - 1) + D$, find the values of A, B, C and D. Hence or otherwise, deduce the remainder when $2x^3 - x^2 - 2x + 3$ is divided by $x^2 + x - 2$ (4)

c) Plot P(3,2) and Q(-3,-2). Draw perpendicular PM   and QN on X axis
1.Find image of P at the origin.
2.Name PMQN find its area
3. When M is mapped on reflection to X-axis, Y- axis and , origin ,find coordinates Use graph paper for this question. Take 1 cm = 1 unit on both the axes.   (3)

<div align="center">Section – B</div>
<div align="center">(Answer any <u>FOUR</u> questions from this Section)</div>

5 a) The numerator of a fraction is one less than its denominator. If three is added to each ofthe numerator and denominator, the fraction is increased by 3/28. Find the fraction?

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6 Are all circles similar ? (3)

   b) Mrs. Kaul invests Rs. 56000 in a textile company paying 5% per annum when its Rs. 100 share can be bought for Rs. 140. Find her annual dividend and her percentage income on investment.

10 (c) A rocket at Sriharikota launching pad having the shape of a cylinder surmounted by a cone .has the following measurements The cylinder is of radius 3 m and height 20 m and the cone has the slant height 5 m. Calculate the surface area and volume of the rocket. (4)

11 a) Priya Goswami has a savings bank account in a bank. Her pass book has the following entries:

Year	Date	Particulars	Debit	Credit	Balance
2000	Feb 10	By cash	--	1000-00	1000-00
	Feb 26	By cheque	--	2000-0	3000-00
	March	By salary	--	5000-00	8000-00
	March 10	By cheque	2000-00	-	6000-00
	March 29	By cash	500-0	-	5500-00
	April 3	By salary	--	5000-00	10500-00

If she closes her account on 15th April and the rate of interest is 5% per annum, find the amount received by her. (5)

b) $\dfrac{8a-5b}{8c-5d}$ = $\dfrac{8a+5b}{8c+5d}$ prove that a/b=c/d

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(3)

b) The mean of the following frequency distribution is 62.8. Find the missing x. (3)

0-20	5
20-40	8
40-60	x
60-80	12
80-10	7
00-120	8

c) A pole 5 m high is   fixed on the top of a tower. The angle of elevation of the top of the pole observed from a point A on the ground is 60° and the angle of depression of point A from the top of the tower is 45°. Find the height of the tower. (Take √3= 1.732) (4)

6 a) Solve $(x-5)^2 +2(x-5) -35 -0$

b) Give an example of reflection on the line y=x
   Give an example of reflection on the X axis
   Give an example of reflection on the Y axis (3)
(3)

c) Water flows out through a circular pipe whose internal radius is 1 cm, at the rate of 80 cm/second into an empty cylindrical tank, the radius of whose base is 40 cm. By how much will the level of water rise in the tank in half an hour ? (4)

7 a) Draw a histogram with the following data of salaries[in thousands] of employees of a Foreign Bank branch in Mumbai

Salary in thousands	no of employees
0-10	50
11-21	300

22-32	250
33-43	400
44-54	550
55-65	440
66-76	260
77-87	350
88 above	100

b) Using the ruler and compasses only: Using a ruler construct a trg with Bc=6.4 cmCA=5.8 and L ABC=60' Draw its incircle. Record the radius

(5)

8 a   If the equation $(1 + m^2) x^2 + 2mcx + c^2 - a^2 = 0$ has equal roots, prove that $c^2 = a^2 (1 + m^2)$.

.   (5)

8 b) find the value of x ,y if
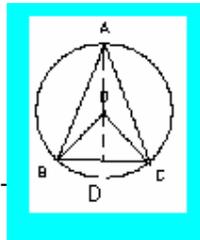
$[1\ 2]\ [x\ \ 0]\ \ = [x\ \ 0]$
$\ \ 3\ 3\ \ \ 0\ \ y\ \ \ \ \ \ \ 0\ \ I$

c) Prove that

$$\frac{sinA}{1 + cos\ A} + \frac{1+ cosA}{sinA} = 2\ cosecA$$

(3)

9a) BC is a chord of a circle with centre O. A is a point on arc BAC as shown   Prove that BAC + OBC = 90°.

(3)
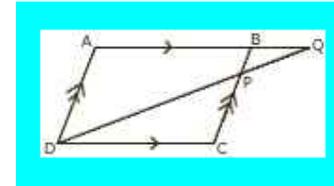

9 b) In the below figure, alongside ABCD is a parallelogram, P is a point on BC such that BP : PC = 1 : 2. DP produced meets AB produced at Q. Given area of triangle BPQ = 20 cm^2, calculate:
(i) Area of triangle CDP;
(ii) Area of parallelogram ABCD   (4)

c) What will Rs.1500 amount to in three years if it is invested in 20% p.a. compound interest, interest being compounded annually?   (3)

10a) Answer yes / no
1.   Are any two equilateral triangles similar?
2 If two isosceles triangles have congruent vertex angles, are the triangles similar?
3 If two isosceles triangles have congruent base angles, are the triangles similar?
4. Is it possible for two quadrilaterals to have congruent angles and not be similar?
5. Are all squares similar to one another?