

अगर आपको इन पेपर्स से मदद मिले तो कृपया आपका पेपर मुझे ईमेल करे जिस से आपके जूनियर्स को मैं पेपर्स उपलब्ध करा सकूँ आपका मोबाइल रिचार्ज भी करूँगे

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BOARD QUESTION PAPER 2013

Mathematics (M.P.) : Class X

Time : 3 Hours

Total : 100

Section A

Objective Type Questions

Q. 1. (A) Choose the correct option and write in your answer-book : $1 \times 5 = 5$

1. In linear equation $a_1x + b_1y + c_1 = 0$, $a_2x + b_2y + c_2 = 0$ the condition for infinitely many solutions is :

(a) $\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$ (b) $\frac{a_1}{a_2} = \frac{b_1}{b_2}$ (c) $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$ (d) $\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$

2. Sum of two numbers is 40 and difference is 20 then the numbers will be :

(a) 29, 11 (b) 32, 8 (c) 30, 10 (d) 20, 20.

3. Sum of zeroes of the polynomial $ax^2 + bx + c$ is :

(a) $\frac{c}{a}$ (b) $-\frac{b}{a}$ (c) $\frac{b}{c}$ (d) $\frac{a}{b}$

4. Additive inverse of the rational expression $x - \frac{1}{x}$ will be :

(a) $x + \frac{1}{x}$ (b) $-x + \frac{1}{x}$ (c) $\frac{x^2 - 1}{x}$ (d) $-\frac{1}{x} + x$

5. Duplicate ratio of $a : b$ will be :

(a) $\sqrt{a} : \sqrt{b}$ (b) $a^3 : b^3$ (c) $a^2 : b^2$ (d) $\sqrt[3]{a} : \sqrt[3]{b}$

Ans. 1. (d), 2. (c), 3. (b), 4. (b), 5. (c).

(B) Choose the correct option and write in your answer-book : $1 \times 5 = 5$

1. If the discriminant of the quadratic equation $ax^2 + bx + c = 0$ is zero, then its roots will be :

(a) Real and equal (b) Real and unequal
(c) Imaginary (d) Zero.

2. When the length of the shadow of a tower is equal to its height, then angle of elevation of the sun will be :

(a) 30° (b) 60° (c) 90° (d) 45° .

3. Angle of semi-circle is:

(a) 60° (b) 90° (c) 180° (d) 360° .

4. The sum of pairs of opposite angles of a cyclic quadrilateral is :

(a) 360° (b) 90° (c) 180° (d) 60° .

5. Direct tax is :

- (a) Service tax (b) Entertainment tax
(c) Revenue stamp duty (d) Property tax.

Ans. 1. (a), 2. (d), 3. (b), 4. (c), 5. (d).

(C) Fill in the blanks :

1 × 5 = 5

- Normally compound interest is than simple interest.
- Rate of depreciation is always
- The perpendicular drawn from the centre of a circle to a chord the chord.
- If corresponding angles of two triangles are equal, then triangles will be.....
- Total number of faces in a cuboid is

Ans. 1. More, 2. Negative, 3. Bisects, 4. Similar, 5. 6.

(D) Write True or False in the following :

1 × 5 = 5

- Probability of getting head in tossing a coin is 1.
- If a line is drawn parallel to one side of a triangle, then it divides the other two sides in the same ratio.
- Whole surface area of a cylinder = $2\pi rh$.
- The length of two tangents drawn from an external point to a circle are not equal.
- Arithmetic mean of first five natural number is 3.

Ans. 1. False, 2. True, 3. False, 4. False, 5. True.

(E) Match the Following :

1 × 5 = 5

'A'

'B'

1. $1 - \sin^2 \theta$

(a) $\frac{\sqrt{3}}{2}$

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2. $\sin 60^\circ$

(b) 1

3. $\sin(90 - \theta)$

(c) $\tan^2 \theta$

4. $\sin^2 25^\circ + \cos^2 25^\circ$

(d) $\cos^2 \theta$

5. $\sec^2 \theta - 1$

(e) $\cos \theta$

Ans. 1. (d), 2. (a), 3. (e), 4. (b), 5. (c).

Section B

Q. 2. Solve the following system of equation by Substitution method :

4

$$x + y = 7, 3x - 2y = 11.$$

Or, Solve the following system of equation by Elimination method :

$$3x + 5y = 20, 6x - 10y = -4.$$

Q. 3. Solve the following equation :

4

$$2x^2 - 13x + 15 = 0.$$

Or, Find two consecutive natural numbers whose squares have the sum 265.

Q. 4. If $\frac{x}{b+c} = \frac{y}{c+a} = \frac{z}{a+b}$, then prove that :

$$(\theta - c)x + (c - a)y + (a - b)z = 0.$$

4

Or, If $a : b = \frac{2}{3}$, then find the value of $\frac{(a + 2b)}{(a - 3b)}$.

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Q. 5. A man observe from the top of the electric pole, the angle of depression of a point on the ground is 60° . If the distance of a point from the foot of the electric pole is 25 m, then find the height of the electric pole. 4

Or, A vertical tower stands on a horizontal plane and is surmounted by a flag-staff of height 7 m from a point on the plane, the angle of elevation of the bottom and the top of flag-staff are 30° and 45° respectively. Find the height of the tower.

Q. 6. Find those values of m the system of equation

$$2x + my - 4 = 0, 3x - 7y - 10 = 0$$

for which (1) there is unique solution and (2) there is no solution. 4

Or, Age of father is three times the age of son. After 5 years father's age will be two and half times the age of son. Find the ages of father and the son at present.

Q. 7. The area of sector is 1,540 sq. cm. The sector subtends 50° at centre, then find the radius of circle. 4

Or, If V is the volume of cuboid whose length is a , breadth is b and height is c and S is its

surface area; then prove that : $\frac{1}{V} = \frac{2}{S} \left(\frac{1}{a} + \frac{1}{b} + \frac{1}{c} \right)$.

Q. 8. Find the Median of the following values of a variable :

5, 10, 3, 7, 2, 9, 6, 2, 11. 4

Or, Find the probability of getting an odd number in a single throw of a die.

Q. 9. If the height of cone is doubled then keeping the same radius, how much times the volume will increase ? 4

Or, An iron sphere of diameter 6 cm is melted and drawn into a cylindrical wire. If the diameter of wire is 0.2 cm, then find the length of wire.

Q. 10. Prove the following identity by geometrical method :

$$\sin^2 \theta + \cos^2 \theta = 1. \quad 5$$

Or, Prove that : $\frac{\sin(90^\circ - A) \cos(90^\circ - A)}{\tan A} = \cos^2 A$.

Q. 11. Construct the circumcircle of triangle ABC in which $AB = 5$ cm, $BC = 7$ cm and $\angle ABC = 60^\circ$. 5

Or, Construct a triangle ABC , in which $BC = 6.5$ cm, $\angle A = 60^\circ$ and median $AD = 4.5$ cm.

Q. 12. A watch is sold for Rs. 960 cash or for Rs. 480 cash down payment and two monthly instalment of Rs. 245 each. Find the rate of interest charged under the instalment plan. 5

Or, Find the compound interest on Rs. 2,000 at the rate of interest 5% per annum for 3 years.

Q. 13. Find the value of p in the equation $2x^2 + 3x - p = 0$, so that the equation has equal roots. 5

Or, If α, β are the roots of quadratic equation $ax^2 + bx + c = 0$, then find the value of

$$\frac{\alpha}{\beta} + \frac{\beta}{\alpha}$$

Q. 14. Factorise :

$$a^2(b+c) + b^2(c+a) + c^2(a+b) + 2abc. \quad 5$$

Or, Which rational expression should be added to $\frac{x^2 - 3x + 1}{x + 3}$ to get $\frac{x^2 + 1}{x - 2}$?

Q. 15. The ratio of the areas of two similar triangles is equal to the ratio of the squares of their corresponding sides. 6

Or, In the triangle ABC , $\angle B$ is an acute angle, AD is an altitude, then prove that :

$$AC^2 = AB^2 + BC^2 - 2BC \cdot BD.$$

Q. 16. The perpendicular from the centre of a circle to a chord bisects the chord. 6

Or, If PAB is a secant to a circle of center O intersecting the circle at A and B and PT is tangent segment, then prove that :

$$PA \times PB = PT^2.$$

Q. 17. Find the mean of the following frequency distribution : 6

Marks obtained	10-20	20-30	30-40	40-50	50-60	60-70	70-80
Number of Students	6	8	13	7	3	2	1

Or, Calculate the cost of living index number for the year 1995 on the basis of 1990 from the following data :

Item	Quantity in kg	Cost (in Rs.) Per kg in year 1990	Cost (in Rs.) Per kg in year 1995
A	8	30.00	45.00
B	5	28.00	36.00
C	12	6.00	11.00
D	40	9.00	15.00
E	18	10.00	12.00