

# MP BOARD CLASS 10 MATHEMATICS MODEL PAPER SET 7 2020

Time: 3 hours

MM: 100

Instructions :

- (i) All questions are compulsory.
- (ii) Q. No. 1 to 5 are objective type questions. Each question carry 3 marks and each sub question carry 1 mark.
- (iii) Q. No. 6 to 10 carries 2 marks each.
- (iv) Q. No. 11 to 14 carries 3 marks each.
- (v) Q. No. 15 to 21 carries 4 marks each.
- (vi) Q. No. 22 to 26 carries 5 marks each.
- (vii) Internal options are given from Q. No. 6 to 26.
- (viii) Draw neat and clean diagram wherever required.

Part (A)

Q. 1. Choose the correct option:

1. If product of two numbers is 32 and L.C.M. is 8, then their H.C.F. will be:  
(a) 4            (b) 2            (c) 1            (d) 0.
2. A quadratic polynomial, whose zeroes are  $-3$  and  $4$  is :  
(a)  $x^2 + x + 12$             (b)  $x^2 - x - 6$             (c)  $x^2 - x - 12$             (d)  $2x^2 + 3x - 24$ .
3. If polynomial  $ax^2 + bx + c$  of the graph is either completely above the X-axis or completely below the X-axis, so polynomial will be zero :  
(a) One            (b) Two            (c) Three            (d) Has no zero.
4. If a pair of linear equations is consistent, then the lines will be:  
(a) Parallel            (b) Always coincident            (c) Intersecting or coincident            (d) Always intersecting.
5. Total number of legs of deer's and crane bird is 180, then the equation will be:  
(a)  $4x - 2y = 180$             (b)  $2x + 2y = 180$             (c)  $x + y = 180$             (d)  $4x + 2y = 180$ .

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

Q. 2. Fill in the blanks :

1. The quadratic equation  $ax^2 + bx + c = 0$  has its discriminant  $D = \dots\dots\dots$
2. A quadratic equation  $ax^2 + bx + c = 0$  has no real roots if.
3. In an arithmetic progression  $d = -4$ ,  $n = 7$  and  $T_n = 4$ , then the value of 'a' will be  $\dots\dots\dots$
4. An event having only one outcome of the experiment is called an  $\dots\dots\dots$  event.
5. Formula of length of an arc of a sector of angle  $\theta$   $\dots\dots\dots$

Ans. 1.  $b^2 - 4ac$ , 2.  $b^2 - 4ac < 0$ , 3.  $a = 28$ , 4. elementary, 5.  $\frac{\theta}{360^\circ} \times 2\pi r$ .

Q.3. Write True or False in the following:

1. The perpendicular drawn from the centre of a circle to a chord bisect the chord.
2. The tangents drawn from an external point to a circle are equal.
3. Two equilateral triangles are similar.

4. Angle of elevation is always acute angle.

5. The mid-point of the line segment joining the points  $A(x_1, y_1)$  and  $B(x_2, y_2)$  is  $\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$ .

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

Q. 4. Match the column:

'A'

'B'

1.  $\cos(90 - \theta)$

(a)  $\sin \theta$

2.  $\tan 30^\circ$

(b) 1

3.  $\sin^2 + \cos^2 \theta$

(c)  $\cos \theta$

4.  $\frac{\cot \theta}{\operatorname{cosec} \theta}$

(d)  $\frac{1}{\sqrt{3}}$

5.  $1 + \cot^2 \theta$

(e)  $\sqrt{3}$

(f)  $\operatorname{cosec}^2 \theta$ .

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

Q.5. Write the answer in one word/sentence :

1. Find the number of terms in each of the following series : 7, 13, 19, ... 205.

2. The mode for grouped data can be found by using the formula.

3. How many types of ogive?

4. The height of a cone, in relation to the diagonal height and radius.

5. Which Indian mathematician calculated the approximate value of  $\pi$ (pie).....

Ans. 1. 34, 2. Mode =  $l = \left(\frac{f_1 - f_0}{2f_1 - f_0 - f_2}\right) \times h$ , 3. 2, 4.  $k = l^2 = h^2 + r^2$ , 5. Aryabhata.

#### Part (B)

Q.6. Find LCM (306, 657) if HCF (306, 657) 9 (Given).

Or, What is Euclid's division lemma ?

Q.7. Find the quadratic polynomial whose sum of zeroes is  $\sqrt{2}$  and product is  $\frac{1}{3}$  ?

Or, For what value of k the quadratic polynomial  $kx^2 + x + k$  has equal zeroes ?

Q.8. Find the distance between the points A (- 5,7) and B (-1,3).

Or, Find the area of triangle whose vertices are: (2, 3), (-1,0), (2,4).

Q.9. From a pack of 52 cards one card is drawn at random. Find the probability of getting a queen of diamond.

Or, A bag contains 3 red balls and 5 black balls. A ball is drawn at random from the bag. What is the probability that the ball drawn is (i) red (ii) not red ?

Q.10. Savita and Hamida are friends. What is probability that both will have

(i) Different birth day's, (ii) The same birthday ? (ignoring a leap years)

Or, A lot of 20 bulbs contain 4 defective ones. One bulb is drawn at random from the lot. What is the probability that this bulb is defective?

Q.11. Find the coordinate of a point A. Where AB is the diameter of a circle whose centre is (2, -3) and B (1,4).

Or, Find the value of 'K' for which the points are collinear : (7,-2), (5, 1), (3, k).

Q.12. If  $\tan(A+B) = \sqrt{3}$ ,  $\tan(A-B) = \frac{1}{\sqrt{3}}$  then find A and B.

Or, If A, B and C are interior angles of triangle ABC then show that:

$$\sin\left(\frac{B+C}{2}\right) = \cos\frac{A}{2}$$

Q.13. From a point the length of the tangent to a circle is 24 cm and the distance of Q from the centre is 25 cm, then find the radius of a circle.

Or, Prove that the tangents drawn at the ends of a diameter of a circle are parallel.

Q.14. On a square handkerchief, nine circular designs each of radius 7 cm are made.

Find the area of the remaining portion of the handkerchief.

Or, The length of the minute hand of a clock is 14 cm. Find the area swept by the minute hand in 5 minutes.

Q.15. Prove that  $\sqrt{5}$  is an irrational number.

Or, Show that any positive odd integer is of the form  $6q+1$  or  $6q+3$  or  $6q+5$ , where q is some integer.

Q.16. Verify that 3, -1,  $\frac{-1}{3}$  are the zeroes of the cubic polynomial  $3x^3 - 5x^2 - 11x - 3$ .

Or, On dividing  $x^3 - 3x^2 + x + 2$  by polynomial  $g(x)$ , the quotient and remainder were  $(x-2)$  and  $(-2x+4)$ . Find  $g(x)$ .

Q.17. The larger of two supplementary angles exceeds the smaller by 18 degree. Find them.

Or, Which of the following pair of linear equations has unique solution, no solution or infinitely many solutions. In case there is unique solution, find it by using cross multiplication method :  $2x + y = 5$ ,  $3x + 2y = 8$ .

Q.18. The sum of the 4th and 8th terms of an A.P. is 24 and the sum of the 6th and 10<sup>th</sup> term is 44. Find the first three terms of the A.P.

Or, If the sum of the first 14 terms of an A.P. is 1050 and its first term is 10, find the 20th term.

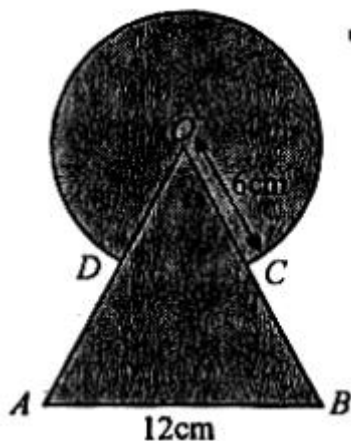
Q.19. The ratio of the corresponding altitudes of two similar triangles is 3 : 5, then find the ratio of their areas. <http://www.mpboardonline.com>

Or, ABC is an isosceles triangle right angled at C. Prove that  $AB^2 = 2AC^2$ .

Q.20. A tree breaks due to storm and the broken part bend so that the top of the tree touch the ground making an angle 30 with it. The distance between the foot of the tree and the point where the top touch the ground is 8 m. Find the height of the tree.

Or, A statue, 1.6 m tall, stands on the top of a pedestal. From a point on the ground, the angle of elevation of the top of the statue is 60° and from the same point the angle of the elevation of the top of the pedestal is 45°. Find the height of the pedestal.

Q.21. Find the area of a quadrant of a circle whose circumference is 22 cm.



Or, Find the area of shaded region in figure, where a circular arc of radius 6 cm has been drawn with vertex O of an equilateral triangle OAB of side 12 cm as centre.

Q.22. Find two numbers whose sum is 27 and product is 182.

Or, Find the roots of the following quadratic equations, if they exist, by the method of completing the square :  $2x^2 - 7x + 3 = 0$ ,

Q. 23. Prove the identity :  $\frac{1 + \sec A}{\sec A} = \frac{\sin^2 A}{1 - \cos A}$ .

Or, Show that :  $\tan 48^\circ \tan 23^\circ \tan 42^\circ \tan 67^\circ = 1$ .

Q. 24. Draw a triangle ABC with side BC = 6cm, AB = 5cm and  $\angle ABC = 60^\circ$ . Then construct a triangle whose sides are  $\frac{3}{4}$  of the corresponding sides of the  $\Delta ABC$ .

Or, Draw a triangle  $\Delta ABC$  with side BC = 7cm,  $\angle B = 45^\circ$ ,  $\angle A = 105^\circ$ . Then, construct a triangle whose sides are times the corresponding sides of SABC.

Q.25. A copper rod of diameter 1 cm and length 8 cm is draw into a wise of length 18m of uniform thickness. Find the thickness of the wire.

Or, A toy is in the form of a cone of radius 3-5cm mounted on a hemisphere of same radius. The total height of the toy is 15-5cm. Find the total surface area of toy.

Q.26. The following table shows the age of the patient admitted in a hospital during a year:

Age (in years)	5-15	15 - 25	25 - 35	35 - 45	45 - 55	55 - 65
Number of patients	6	11	21	23	14	5

Or, The distribution below gives the weight of 30 students of class. Find the median weight of the students :

Weight (in kg)	40 - 45	45 - 50	50 - 55	55 - 60	60-65	65-70	70-75
Number of students	2	3	8	6	6	3	2