MP BOARD CLASS 10 MATHEMATICS MODEL PAPER SET 6 2020

Part (A)

Q. 1. Choose the correct option:

1. The H.C.F. of 96 and 404 is :

(a) 120 1.   (b) 4   (c) 10   (d) 3.

2. If one of the zeroes of the quadratic polynomial $(k-1)x^2 + kr +1$ is -3, then the value of k:

(a) $\dfrac{-4}{3}$ (b) $\dfrac{4}{3}$ (c) $\dfrac{2}{3}$ (d) $\dfrac{-2}{3}$.

3. If the graph of polynomial Y=P(x) cuts the X-axis at 3 points, then the number of zeros will be :

(a) 1   (b) 2   (c) 3   (d) None of these.

4. If ΔABC has $\angle C = 2(\angle A + \angle B)$, then the value of $\angle C$ will be:

(a) 30°   (b) 60°   (c) 90°   (d) 120°.

5. The nature of the parallelogram 2x+3y-9 = 0 and 4x+6y - 18 = 0 is :

(a) Coincident   (b) Parallel   (c) Interspersed   (d) None of these

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

Q. 2. Fill in the blanks :

1. A root of the quadratic equation $6x^2-x - 2 = 0)$ ....

2. A quadratic equation has no real roots if ....

10th term of the A.P. 1,-1,-3,-5 is ....

4. The difference between the sum of the first terms and the sum of the first (n -1)..........

5. All squares are ....

Ans. 1. (3x - 2) or (2x+1), 2. $b^2 - 4ac < 0$, 3. -17, 4. n^{th} term (a_n), 5. Similar.

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

1. Length of an arc of a sector of angle $\theta = \dfrac{\theta}{360^o} \times 2\pi r^2$.

2. Minute needle of a clock an angle of 6° rotates in minutes.

3. A circle may have two parallel tangent lines.

4. The parallelogram of a circle is a rhombus.

5. Area of trapezium = (Sum of parallel sides) × Distance between them.

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

Q. 3. Match the column :

	Column 'A'		Column 'B'
1.	$1 + \cot^2 A$	(a)	1
2.	$\sin 25° \cos 65° + \cos 25° \sin 65°$	(b)	$\operatorname{cosec}^2 A$
3.	$\dfrac{1 + \tan^2 A}{1 + \cot^2 A}$	(c)	$\tan^2 A$
4.	$9 \sec^2 A - 9 \tan^2 A$	(d)	$\cos A$
5.	$\sqrt{1 - \sin^2 A}$	(e)	9.

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

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

1. If the probability of occurrence of an event in an experiment is P(E), then what is the probability that the event will not occur ?

2. Write the formula of to find the median of the classified data.

3. What is the relationship between the mean, the median and mode?

4. What is the relationship between the oblique height, height and radius of a cone ?

5. What is the line connecting the object that we are seeing with our eye?

Ans. 1. 1-P(E), 2. Median= $l + \dfrac{\left(\dfrac{n}{2} - cf\right)}{f} \times h$, 3. Median+Mode+2 Mean, 4. $l^2 = h^2 + r^2$, 5. Line of sight.

Part (B)

Q.6. Using prime factorization method find HCF and LCM of following numbers : 8, 9 and 25.

Or, Find the LCM and HCF of 6 and 20 by the prime factorisation method.

Q. 7. Find the zeroes of the following polynomials and verify, the relationship between the zeroes and the coefficients : x^2 - 2x -8.

Or, Find a quadratic polynomial, the sum and product of whose zeroes are-3 and 2, respectively.

Q. 8. Find the value of y for which the distance between the points P (2, -3) and (10, y) is 10 units.

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

Q.9. Adie is thrown ? What is the probability of getting even number?

Or, If P($\overline{E}$) = 0.05, what is the probability of P(E)?

Q. 10. A die is thrown once. Find the probability of getting a prime number.

Or, Harpreet tosses two different coins simultanconsly. What is the probability that she gets at least one head ?

Q. 11. Find a relation between x and y such that the point (x, y) is equidistant from the points (3,6) and (-3, 4).

Or, Find the ratio in which the line segment joining the points (-3, 10) and (6,-8) is divided by (-1,6).

Q. 12. Prove by geometrical method : $\sin^2 A + \cos^2 A = 1$.

Or, Show that : cos 38° cos 52° -sin 38° sin 52°= 0.

Q. 13.   Prove that the length of two tangents drawn from an external point to a circle are equal.

Or,   From a point P the length of tangent to a circle is 8 cm and distance of P from the centre is 10 cm. Then find the radius of a circle.

Q. 14.   Find the sum of area of major sector of a circle and their corresponding minor sector.

Or,   The radii of two circles are 8 cm and 6 cm respectively. Find the radius of the circle having area equal to the sum of the areas of the two circles.

Q. 15.   There is a circular path around a sport ficld. Sonia takes 18 minutes to drive one round of the field, while Ravi takes 12 minutes for the same, suppose they both start at the same point at the same time, and go in the same direction. After how many minutes will they meet again at the starting point ?

Or,   Prove that the rational number is irrational : $7\sqrt{5}$.

Q. 16.   Find all the zeroes of $2x^4$ - $3x^3$ - $3x^2$ + 6x-2, if you know that two of its zeroes are $\sqrt{2}$ and $-\sqrt{2}$.

Or,   Check whether the polynomial 3x4 + 5x3 - 7x2 + 2x + 2 is divided by x + 3x +1.

Q. 17.   Solve the following pair of linear equations by substitution method :

s - t = 3

$\dfrac{s}{3} + \dfrac{t}{2} = 6.$

Or,   The difference between two numbers is 26 and one number is three times the other. Find them.

Q. 18.   Find the number of terms in each of the following A.P.:

$18, \ 15\dfrac{1}{2}, 13, ..., -47$

Or,   Which term of the A. P. 3, 15, 27, 39, ... will be 132 more than its 54th term ?

Q. 19.   In figure ABD is a right angled triangle at A and AC $\perp$ BD. Show that:
$AC^2 = BC. \ DC.$

Or,   Prove that the area of an equilateral triangle described on one side of square is equal to half the area of the equilateral triangle describe on one of its diagonal.

Q. 20.   The angle of elevation of the top of a tower from two points at a distance of 4 m and 9m from the base of the tower and in the same straight line with it are complementary. Prove that the height of tower is 6 m. http://www.mpboardonline.com

Or,   From the top of a 7m high building, the angle of elevation of the top of a cable tower is 60° and the angle of depression of its foot is 45°. Determine the height of the tower.

Q. 21.   The cost of fencing a circular field at the rate of 24 per metre is 5280. The field is to be ploughed at the rate of 0-50 per m^2. Find the cost of ploughing the filed (take $\pi = \dfrac{22}{7}$)

Or,   The wheels of a car are of diameter 80 cm each. How many complete revolution does each wheel make in 10 minutes when the car is travelling at a speed of 66 km per hour ?

Q. 22.   Find the roots of the following quadratic equations, if they exist, by the method of completing the square : $4x^2 + 4\sqrt{3}x + 3 = 0.$

Or,   Find two consecutive positive integers, sum of whose squares is 365.

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

Or, Prove the identity $(\cos ec\,\theta - \cot \theta)^2 = \dfrac{1-\cos \theta}{1+\cos \theta}$

Q. 24. Draw a circle of radius 6 cm from a point 10 cm away from its centre, construct the pair of tangents to the circle and measure their length.

Or, Construct a triangle similar to a given triangle AABC with its side equal to $\dfrac{5}{3}$ of the corresponding sides of the triangle ABC.

Q. 25. How many silver coins 1.75 cm in diameter and of thickness 2mm, must be melted to form a cuboid of dimension 5.5cm x 10cm x 3.5cm.

Or, A copper rod of diameter 1 cm and length 8 cm is drawn into a wire of length 18 m is drawn into a wire of length 18 m of uniform thickness. Find the thickness of the wire.

Q. 26. The following table gives the literacy rate (in percentage) of 35 cities. Find the mean literacy rate :

Literacy rate in%	45 - 55	55-65	65-75	75-85	85 - 95
Number of cities	3	10	11	8	3

Or, The following frequency distribution gives the monthly consumption of electricity of 68 consumers of a locality. Find the median of the data :

Monthly consumption	65-85	85-105	105-125	125-145	145-165	165-185	185-205
No. of consumers	4	5	13	20	14	8	4