**Mathematics**

Class X

TOPPER SAMPLE PAPER-1

Maximum Marks: 80   **Time: 3 Hrs**

1. All questions are compulsory.

2. The question paper consist of 30questions divided into four sections A, B,C and D. Section A comprises of 10 questions of one mark each, section B comprises of 5 questions of two marks each ,section C comprises of 10 questions of three marks each and section D comprises of 5 questions of six marks each.

3. All questions in Section A are to be answered in one word, one sentence or as per the exact requirement of the question.

4. In question on construction, the drawing should be neat and exactly as per the given measurements.

5. Use of calculators is not permitted. You may ask for mathematical tables, if required.

6. There is no overall choice. However, internal choice has been provided in one question of 02 marks each, three questions of 03 marks each and two questions of 06 marks each. You have to attempt only one of the alternatives in all such questions.
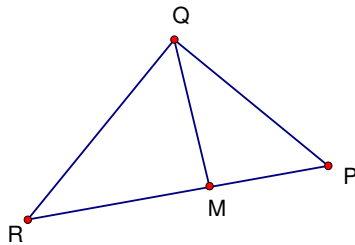
Section A

Q1   If HCF (252, 378) = 126, find their LCM.

Q2   Find the polynomial shown in the graph.
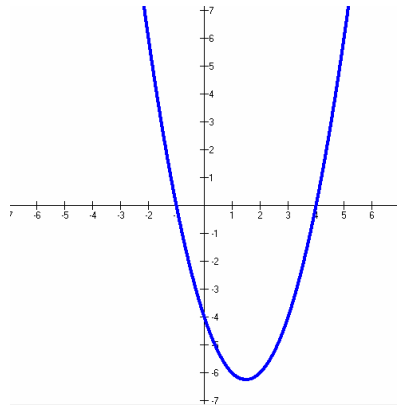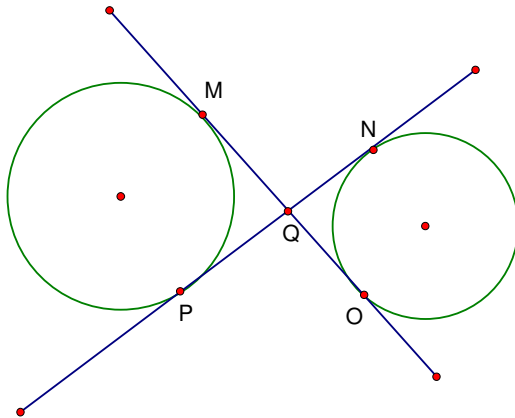
Q3 For what value of 'k' will the equations 13x+23y-1=0 and kx−46y-2=0 represents intersecting lines?

Q4 QM $\perp$ RP and $PR^2 - PQ^2 = QR^2$. If $\angle$QPM = 30^0, find $\angle$MQR.


Q5 Find the length of PN if OM = 9 cm.

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Q6   If the median of a data which represents the weight of 150 students in a school is 45.5 kg, find the point of intersection of the less than and more than ogive curves.

Q7   If two coins are tossed simultaneously, find the probability of getting exactly two heads.

Q8   If three times the third term of an AP is four times the fourth term , find the seventh term.

Q9   If $\sin\alpha + \cos\alpha = \sqrt{2}\cos(90 - \alpha)$, find $\cot\alpha$.

Q10   Find the perimeter of the figure , where AC is the diameter of the semi circle and AB $\perp$ BC
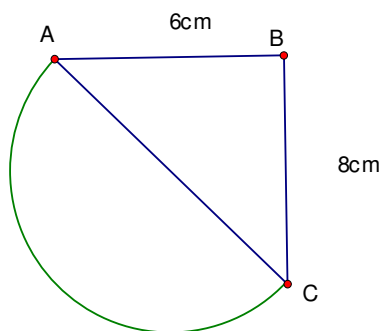
SECTION B

Q11   A and B are points (1, 2) and (4, 5) . Find the coordinates of a point P on AB if AP = $\dfrac{2}{5}$ AB.

Q12 $\triangle ABC$ is right angled at C. Let BC = a , AB = c and AC = b. p is the length of the perpendicular from C to AB. Prove that $\dfrac{1}{p^2} = \dfrac{1}{a^2} + \dfrac{1}{b^2}$

Q13 Solve for x and y : 3(2x+y) = 7xy, 3(x +3y) = 11xy

Q14 Find the probability of getting 5 Wednesdays in the month of August.

Q15 If sin (A + B) = 1 and cos (A - B)= $\dfrac{\sqrt{3}}{2}$, $0 \le A + B \le 90°$, A >B , find A and B.

OR

If tan A = $\dfrac{7}{24}$, evaluate $\sqrt{\dfrac{1 - \cos A}{1 + \cos A}}$

SECTION C

Q16 Prove that $\sqrt{5}$ is an irrational number.

Q17 Find the coordinates of a point(s) whose distance from (0,5) is 5 units and from (0,1) is 3 units.

Q18 Prove $(\sin A + \cos ec A)^2 + (\cos A + \sec A)^2 = \tan^2 A + \cot^2 A + 7$

OR

Prove $(1 + \cot \theta - \cos ec \theta)(1 + \tan \theta + \sec \theta) = 2$

Q19 Solve for x and y : $\dfrac{10}{x + y} + \dfrac{4}{y - x} = -2$, $\dfrac{15}{x + y} - \dfrac{7}{y - x} = 10, \quad x + y \ne 0, x \ne y$

OR

For what values of 'm' will $2mx^2 - 2(1 + 2m)x + (3 + 2m) = 0$ have real and

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distinct roots?

Q20 Find the area of a triangle whose sides have (10, 5), (8, 5) and (6, 6) as the midpoints.

Q21 If α, β are the zeroes of the polynomial $3x^2 - 11x + 14$, find the value of $\alpha^2 + \beta^2$.

Q22 Prove that a parallelogram circumscribing a circle is a rhombus.

OR

Prove that the opposite sides of a quadrilateral circumscribing a circle subtend supplementary angles at the centre of the circle.

Q23 Draw a circle of radius 3.5 cm. Construct two tangents to the circle which are inclined to each other at $120°$.

Q24 A grassy plot is in the form of a triangle with sides 45m, 32m and 35m. One horse is tied at each vertex of the plot with a rope of length 14m. Find the area grazed by the three horses.

Q25 The 46th term of an AP is 25. Find the sum of first 91 terms.

SECTION D

Q26 Prove that ratio of the areas of two similar triangles is equal to the ratio of the squares of their corresponding sides.
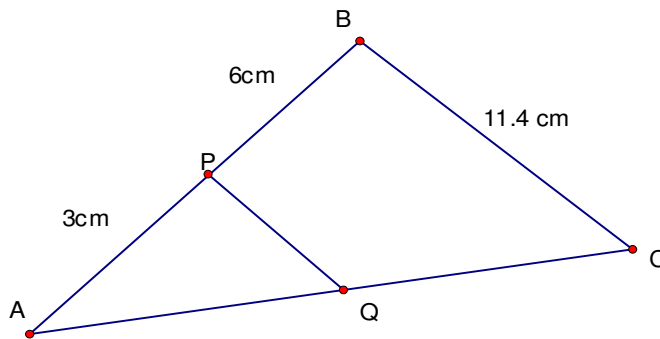
Using this theorem find the ratio of the area of the triangle drawn on the diagonal of a square and the triangle drawn on one side of the square.

OR

State and prove the Basic Proportionality Theorem. If PQ II BC, find

PQ.

Q27 The area of a rectangle remains the same if the length is increased by 7m and the breadth is decreased by 3 m. The area of the rectangle remains the same if the length is decreased by 7m and the breadth is increased by 5 m. Find the dimensions of the rectangle and the area of the rectangle.

Q28 A boy is standing on the ground and flying a kite with a string of 150m at an angle of $30°$. Another boy is standing on the roof of a 25m high building and flying a kite at an angle of $45°$. Both boys are on the opposite sides of the kites. Find the length of the string the second boy must have so that the two kites meet.

OR

At a point on level ground, the angle of elevation of a vertical tower is such that its tangent is $\dfrac{5}{12}$. On walking 192 m towards the tower, the tangent of the angle of elevation is $\dfrac{3}{4}$. Find the height of the tower.

Q29 A solid consists of a cylinder with a cone on one end and a hemisphere on the other end. If the length of the entire solid is 12.8cm and the diameter and height of the cylinder are 7cm and 6.5 cm respectively, find the total surface area of the solid.

Q30 Draw a less than ogive of the following data and find the median from the graph. Verify the result by using the formula.

Marks	Less than 140	Less than 145	Less than 150	Less than 155	Less than 160	Less than 165
No. of girls	4	11	29	40	46	51

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