

CBSE Board
Class X Mathematics
Term II
Sample Paper - 10

Time: 3 hrs

Total Marks: 90

General Instructions:

1. All questions are **compulsory**.
2. The question paper consists of **34** questions divided into **four sections** A, B, C, and D. **Section A** comprises of **8** questions of 1 mark each, **Section B** comprises of **6** questions of 2 marks each, **Section C** comprises of **10** questions of 3 marks each and **Section D** comprises of **10** questions of 4 marks each.
3. Question numbers **1 to 8** in **Section A** are multiple choice questions where you are to select **one** correct option out of the given four.
4. Use of calculator is **not** permitted.

Section A

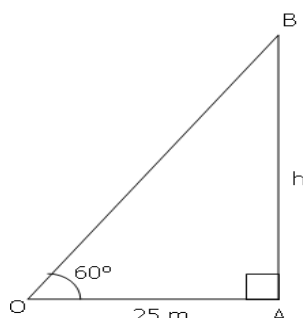
(Questions 1 to 8 carry 1 mark each)

1. A cylinder and a cone are of the same base radius and height. The ratio of the volume of the cylinder to that of the cone is:
 - A. 1 : 2
 - B. 2 : 3
 - C. 3 : 1
 - D. 1 : 3

2. Which of the following equations has the sum of its roots as 3?
 - A. $2x^2 - 3x + 6 = 0$
 - B. $-x^2 + 3x - 3 = 0$
 - C. $x^2 + 5x + 6 = 0$
 - D. $3x^2 - 3x + 3 = 0$

3. The distance between the points (3, 4) and (8, -6) is
 - A. $\sqrt{5}$ units
 - B. $2\sqrt{5}$ units
 - C. $3\sqrt{5}$ units
 - D. $5\sqrt{5}$ units

4. From the given figure, find h.



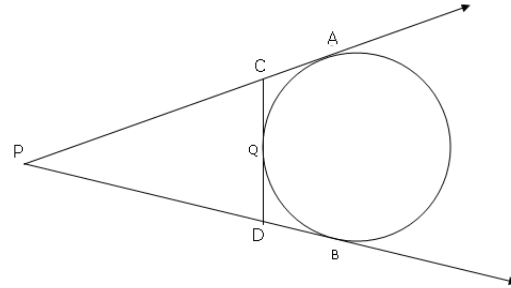
 - A. $25\sqrt{3}$ m
 - B. $2\sqrt{3}$ m
 - C. $50\sqrt{3}$ m
 - D. $\sqrt{3}$ m

5. If $\frac{4}{5}$, a , and 2 are three consecutive terms of an A.P., then the value of a is:

- A. $\frac{1}{5}$
- B. $\frac{2}{5}$
- C. $\frac{7}{5}$
- D. $\frac{9}{5}$

6. In the given figure, PA and PB are tangents drawn from an external point P to a circle. CD is the third tangent touching the circle at Q . If $PB = 10$ cm and $CQ = 2$ cm, then the length of PC is:

- A. 8 cm
- B. 10 cm
- C. 12 cm
- D. 14 cm



7. From a well-shuffled pack of 52 cards, a card is drawn at random. The probability that it is a face card is:

- A. $\frac{1}{13}$
- B. $\frac{2}{13}$
- C. $\frac{4}{13}$
- D. $\frac{3}{13}$

8. The ratio in which the point $P(-3, y)$ divides the line segment joining the points $A(-5, -4)$ and $B(-2, 3)$ is

- A. $-2 : 1$
- B. $2 : 1$
- C. $2 : -1$
- D. $1 : 2$

Section B**(Questions 9 to 14 carry 2 marks each)**

9. Show that $(a - b)$, a and $(a + b)$ form consecutive terms of an A.P.
10. In two concentric circles, the radius of the inner circle is 5 cm. A chord of length 24 m of the outer circle becomes a tangent to the inner circle. Find the radius of the larger circle.
11. Form a quadratic equation whose roots are $\frac{-1}{3}$ and $\frac{5}{2}$.
12. How many solid spheres of diameter 6 cm are required to be melted to form a solid metal cylinder of height 45 cm and diameter 4 cm?
13. Determine the ratio in which the point $P(x, -2)$ divides the line of $A(-4, 3)$ and $B(2, -4)$. Also, find the value of x .
14. Two cubes each of edge 4 cm are joined face to face. Find the surface area of the resulting cuboid.

Section C**(Questions 15 to 24 carry 3 marks each)**

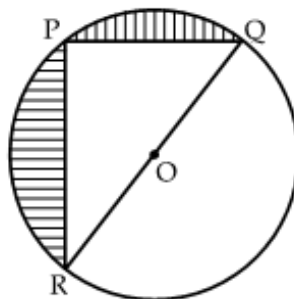
15. If the co-ordinates of the mid-points of the sides of a triangle are $(-1, -3)$, $(2, 1)$ and $(4, 5)$, find the co-ordinates of its vertices.
16. What is the probability of having 53 Thursdays in a leap year?
17. As observed from the top of a lighthouse, 100 metres high above sea level, the angle of depression of a ship moving directly towards it, changes from 30° to 60° . Determine the distance travelled by the ship during the period of observation.
18. Prove that the angle between the two tangents drawn from an external point to a circle is supplementary to the angle subtended by the line-segment joining the points of contact at the centre.
19. Find the sum: $-5 + (-8) + (-11) + \dots + (-230)$
20. The radii of the internal and external surfaces of a metallic spherical shell are 3 cm and 5 cm respectively. It is melted and recast into a solid right circular cylinder of height $10\frac{2}{3}$ cm. Find the diameter of the base of the cylinder.

21. Construct a triangle similar to a given $\triangle ABC$, with sides measuring 5 cm, 6 cm and 8 cm, such that its sides are $\frac{6}{5}$ of the corresponding sides of $\triangle ABC$.
22. For what value(s) of p does the equation $px^2 + (p - 1)x + (p - 1) = 0$ have a repeated root?
23. A girl empties a cylindrical bucket full of sand, of base radius 18 cm and height 32 cm, on the floor to form a conical heap of sand. If the height of this conical heap is 24 cm, then find its slant height corrected upto one decimal place.
24. The m^{th} term of an A.P. is n and the n^{th} term is m . Find the $(m + n)^{\text{th}}$ term of this A.P.

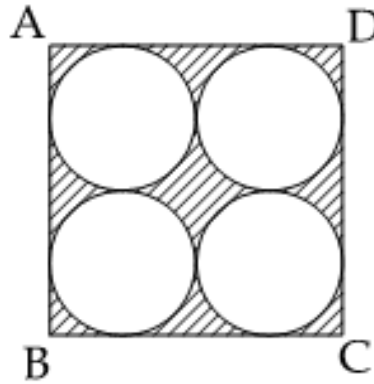
Section D

(Questions 25 to 34 carry 4 marks each)

25. A motor boat, whose speed is 15 km/hr in still water, goes 30 km downstream and comes back in a total time of 4 hrs 30 mins. Find the speed of the stream.
26. A building is in the form of a cylinder surmounted by a hemispherical dome. The base diameter of the dome is equal to $\frac{2}{3}$ of the total height of the building. Find the height of the building, if it contains $67\frac{1}{21}$ m³ of air.
27. Solve the equation: $1 + 4 + 7 + 10 + \dots + x = 287$
28. Two dice are thrown simultaneously. Find the probability that the sum of the two numbers appearing on their top is less than or equal to 10.
29. Prove that the lengths of tangents drawn from an external point to a circle are equal.
30. Find the area of the shaded region in fig., if $PR = 24$ cm, $PQ = 7$ cm and O is the centre of the circle. (use $\pi = \frac{22}{7}$)



- 31.** A straight highway leads to foot of a tower. A man standing at the top of the tower observes a car at an angle of depression of 30° , which is approaching the foot of the tower with a uniform speed. Six seconds later the angle of depression of the car is found to be 60° . Find the time taken by the car to reach the foot of the tower from this point.
- 32.** Find the area of the shaded region in figure, where ABCD is a square of side 14 cm and four circles are of same radii each.



- 33.** A sphere of diameter 6 cm is dropped into a cylindrical vessel partly filled with water. The radius of the vessel is 6 cm. If the sphere is completely submerged in water, find by how much the surface level of water will be raised.
- 34.** Refer to the given figure. A road 8 km long is constructed along the chord PQ of a circular plot of radius 5 km. Two more roads are to be constructed from an external point T to the circle and tangential to it at P and Q. If expenses are Rs. 12000 per km for constructing the new roads TP and TQ, find the total cost of the roads to be constructed. How can the quality of roads be improved and the cost of construction be controlled?

