

CBSE Board
Class X Mathematics
Term II
Sample Paper - 8

Time: 3 hrs

Total Marks: 90

General Instructions:

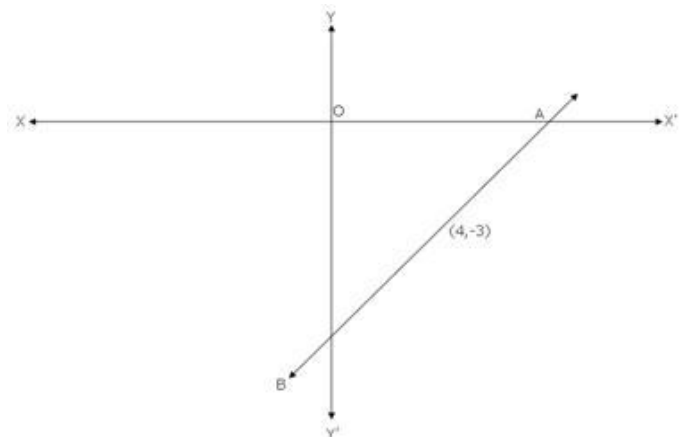
1. All questions are **compulsory**.
2. The question paper consists of **34** questions divided into **four sections** A, B, C, and D. **Section A** comprises of **8** questions of 1 mark each, **Section B** comprises of **6** questions of 2 marks each, **Section C** comprises of **10** questions of 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. The distance between two parallel tangents of a circle of radius 5 cm is
 - A. 10 cm
 - B. 5 cm
 - C. 8 cm
 - D. 9 cm
2. The probability of occurrence of event A is denoted by $P(A)$. So, the range of $P(A)$ is
 - A. $0 < P(A) < 1$
 - B. $0 \leq P(A) < 1$
 - C. $0 < P(A) \leq 1$
 - D. $0 \leq P(A) \leq 1$
3. A tree is broken by the wind. The top struck the ground at an angle of 30° and at a distance of 30 metres from the foot of the tree. The height of the tree in metres is
 - A. $25\sqrt{3}$
 - B. $30\sqrt{3}$
 - C. $35\sqrt{3}$
 - D. $40\sqrt{3}$

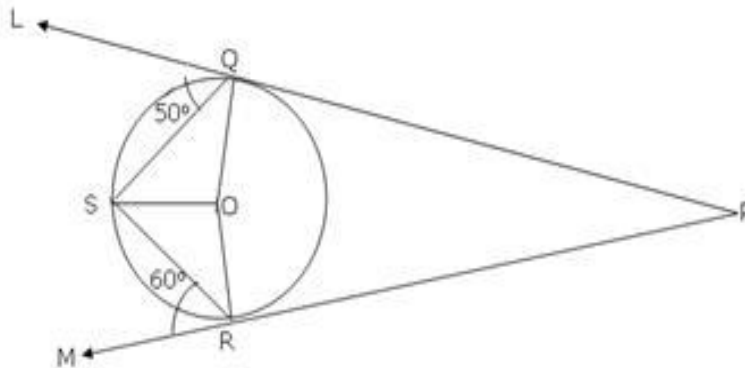
4. AB is divided into 3 equal parts at P and Q. If $AB = xAQ$, then $x =$
- $\frac{1}{2}$
 - $\frac{3}{2}$
 - $\frac{2}{3}$
 - $\frac{1}{3}$
5. If the perimeter and area of a circle are numerically equal, then the radius of the circle is
- 2 units
 - π units
 - 4 units
 - 7 units
6. The ratio of the volume of a cube to that of a sphere which will exactly fit inside the cube is
- $\pi : 8$
 - $\pi : 6$
 - $8 : \pi$
 - $6 : \pi$
7. The first and last terms of an A.P. are 1 and 11. If the sum of all its terms is 36, then the number of terms will be
- 5
 - 6
 - 7
 - 8
8. The mid-point of the line segment AB in given figure is $(4, -3)$. The respective co-ordinates of A and B are

- $(8, 0)$ and $(0, 6)$
- $(-8, 0)$ and $(0, 6)$
- $(6, 0)$ and $(0, 8)$
- $(8, 0)$ and $(0, -6)$



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

9. Find the roots of the quadratic equation $2x^2 - \sqrt{5}x - 2 = 0$ using the quadratic formula.
10. In given figure, PQL and PRM are tangents to the circle with centre O at the points Q and R respectively. S is a point on the circle such that $m\angle SQL = 50^\circ$ and $\angle SRM = 60^\circ$. Find the value of $\angle QSR$.

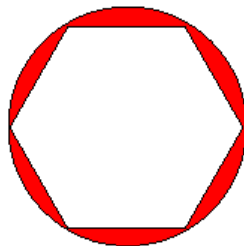


11. Find the value of k for which $2k + 7$, $6k - 2$ and $8k + 4$ form 3 consecutive terms of an AP.
12. If d_1 , d_2 ($d_2 > d_1$) are the diameters of two concentric circles and c is the length of a chord of a circle which is tangent to the other circle, then prove that $d_2^2 = c^2 + d_1^2$.
13. In a circle of radius 10 cm, an arc subtends an angle of 90° at the centre. Find the area of the major sector.
14. Calculate the area of the coloured region in the given figure, which is common between the two quadrants of two circles of radius 8 cm each.



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

15. Find the values of k for which the given equation has real and equal roots:
 $2x^2 - 10x + k = 0$.
16. What is the probability of having 53 Thursdays in a non-leap year?
17. If the points $A(7, -2)$, $B(5, 1)$ and $C(3, k)$ are collinear, then find the value of k .
18. If the mid-point of the line segment joining the points $A(3, 4)$ and $B(k, 6)$ is $P(x, y)$, and $x + y - 10 = 0$, then find the value of k .
19. Find three terms of an A.P. whose sum is 3 and product is -8 .
20. A circle touches the side BC of $\triangle ABC$ at P and the extended sides AB and AC at Q and R respectively. Prove that $AQ = \frac{1}{2}(BC + CA + AB)$
21. At a point on level ground, the angle of elevation of a vertical tower is found to be such that its tangent is $\frac{5}{12}$. On walking 192 metres towards the tower, the tangent of the angle of elevation is $\frac{3}{4}$. Find the height of the tower.
22. A round table cover has six equal designs as shown in the figure. If the radius of the cover is 28 cm, find the cost of making the design at the rate of Rs. 0.35 per cm^2 .



23. A cone of maximum size is carved out from a cube of edge 14 cm. Find the surface area of the cone and of the remaining solid left out after the cone is carved out.
24. A canal is 300 cm wide and 120 cm deep. The water in the canal is flowing at a speed of 20 km/h. How much area will it irrigate in 20 minutes if 8 cm of standing water is desired?

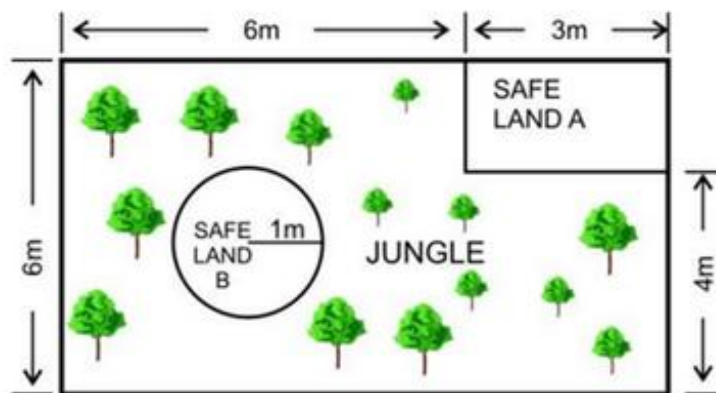
Section D
(Questions 25 to 34 carry 4 marks each)

- 25.** Two water taps together can fill a tank in $9\frac{3}{8}$ hours. The tap with a larger diameter takes 10 hours less than the tap with the smaller diameter to fill the tank separately. Find the time in which each tap can separately fill the tank.
- 26.** Prove that the lengths of tangents drawn from an external point to a circle are equal.
- 27.** Given a rhombus ABCD in which AB = 4 cm and $m\angle ABC = 60^\circ$. Divide it into two triangles say, $\triangle ABC$ and $\triangle ADC$. Construct the $\triangle AB'C'$ similar to $\triangle ABC$ with scale factor $\frac{2}{3}$. Draw a line segment C'D' parallel to CD where D' lies on AD. Is AB'C'D' a rhombus? Give reasons to support your answer.
- 28.** In November 2009, the number of visitors to a zoo increased daily by 20. If a total of 12300 people visited the zoo in that month, find the number of visitors on 1st Nov. 2009.
- 29.** A bucket is in the form of a frustum of a cone of height 30 cm with radii of its lower and upper ends as 10 cm and 20 cm respectively. Find the capacity and surface area of the bucket. Also, find the cost of the milk required to completely fill the bucket, at the rate of Rs. 25 per litre (use $\pi = 3.14$).
- 30.** A round balloon of radius r subtends an angle θ at the eye of the observer while the angle of elevation of its centre is ϕ . Prove that the height of the centre of the balloon is $r \sin \phi \cdot \operatorname{cosec} \frac{\theta}{2}$.
- 31.** A two digit number is such that the product of its digits is 18. When 63 is subtracted from the number, the digits interchange their places. Find the number.
- 32.** A copper wire of 4 mm diameter is evenly wound around a cylinder whose length is 24 cm and diameter 20 cm so as to cover whole surface. Find the length and weight of the wire assuming the density to be 8.68 gm/cm^3 .

33. Due to some default in the engine of a helicopter, a pilot has to make an emergency landing in an area as shown in the given figure.

- What is the probability of safe landing?
- What is the probability of landing in the jungle?
- As it has a larger area, the pilot decided to land on Safe Land A rather than Safe Land B.

Which value does the pilot show?



34. Find the area of a triangle formed by joining the mid-points of the sides of a triangle whose vertices are $(0, -1)$, $(2, 1)$ and $(0, 3)$. Find the ratio of the area of the newly formed triangle to that of the original triangle.