

**CBSE Class 10 Maths (Standard)
Question Paper 2020 Set 3**

CLASS: X

MATHEMATICS STANDARD
SET 3 SOLVED (CODE : 30/5/3)

General Instructions:

Read the following instructions very carefully and strictly follow them:

- i. This question paper comprises four sections – A, B, C and D. This question paper carries 40 questions. All questions are compulsory.
- ii. Section A: Question numbers 1 to 20 comprises of 20 questions of one mark each.
- iii. Section B: Question numbers 21 to 26 comprises of 6 questions of two marks each.
- iv. Section C: Question numbers 27 to 34 comprises of 8 questions of three marks each.
- v. Section D: Question numbers 35 to 40 comprises of 6 questions of four marks each.
- vi. There is no overall choice in the question paper. However, an internal choice has been provided in 2 questions of one mark, 2 questions of two marks, 3 questions of three marks and 3 questions of four marks. You have to attempt only one of the choices in such questions.
- vii. In addition to this, separate instructions are given with each section and question, wherever necessary.
- viii. Use of calculators is not permitted.

SECTION – A

Question numbers 1 to 20 carry 1 mark each.

Question numbers 1 to 10 are multiple choice questions.

Choose the correct option.

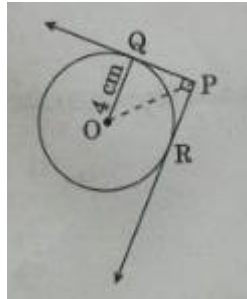
1. The value(s) of k for which the quadratic equation $2x^2 + 5x + 2 = 0$ has equal roots, is
(a) 4 (b) ± 4 (c) -4 (d) 0
2. Which of the following is **not** an A.P.?
(a) -1.2, 0.8, 2.8, (b) $3, 3 + \sqrt{2}, 3 + 2\sqrt{2}, 3 + 3\sqrt{2}, \dots$
(c) $\frac{4}{3}, \frac{7}{3}, \frac{9}{3}, \frac{12}{3}, \dots$ (d) $\frac{-1}{5}, \frac{-2}{5}, \frac{-3}{5}, \dots$
3. The radius of sphere (in cm) whose volume is $12\pi \text{ cm}^3$, is
(a) 3 (b) $3\sqrt{3}$ (c) $3^{\frac{2}{3}}$ (d) $3^{\frac{1}{3}}$
4. The distance between the points $(m, -n)$ and $(-m, n)$ is
(a) $\sqrt{m^2 + n^2}$ (b) $m + n$ (c) $2\sqrt{m^2 + n^2}$ (d) $\sqrt{2m^2 + 2n^2}$
5. In Figure-1, from an external point P, two tangents PQ and PR are drawn to a circle of radius 4 cm with centre O. If $\angle QPR = 90^\circ$, then length of PQ is
(a) 3 cm (b) 4 cm (c) 2 cm (d) $2\sqrt{2}$

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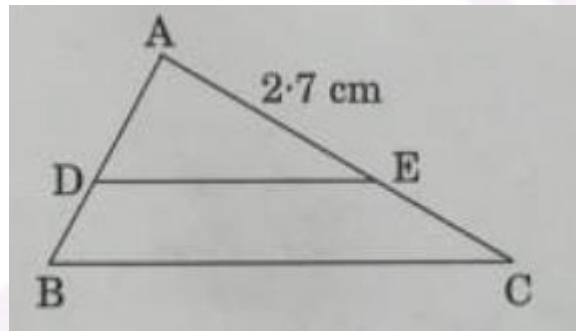


6. On dividing a polynomial $p(x)$ by $x^2 - 4$, quotient and remainder are found to be x and 3 respectively. The polynomial $p(x)$ is

- (a) $3x^2 + x - 12$ (b) $x^3 - 4x + 3$ (c) $x^2 + 3x - 4$ (d) $x^3 - 4x - 3$

7. In Figure-2, $DE \parallel BC$. If $\frac{AD}{DB} = \frac{3}{2}$ and $AE = 2.7$ cm, then EC is equal to

- (a) 2.0 cm (b) 1.8 cm (c) 4.0 cm (d) 2.7 cm



8. The point on the x-axis which is equidistant from $(-4, 0)$ and $(10, 0)$ is

- (a) $(7, 0)$ (b) $(5, 0)$ (c) $(0, 0)$ (d) $(3, 0)$

(OR)

The centre of a circle whose end points of a diameter are $(-6, 3)$ and $(6, 4)$ is

- (a) $(-8, -1)$ (b) $(4, 7)$ (c) $\left(0, \frac{7}{2}\right)$ (d) $\left(4, \frac{7}{2}\right)$

9. The pair of linear equations

$$\frac{3x}{2} + \frac{5y}{3} = 7 \text{ and } 9x + 10y = 14 \text{ is}$$

- (a) consistent (b) inconsistent
(c) consistent with one solution (d) consistent with many solutions

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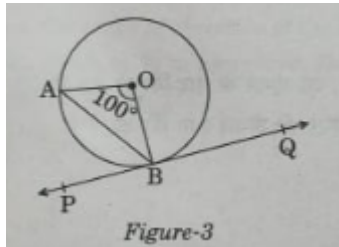
10. In figure-3, PQ is tangent to the circle with centre at O, at the point B. If $\angle AOB = 100^\circ$, then $\angle ABP$ is equal to

(a) 50°

(b) 40°

(c) 60°

(d) 80°



Fill in the blanks in question number 11 to 15

11. Simplest form of $\frac{1 + \tan^2 A}{1 + \cot^2 A}$ is _____

12. If the probability of an event E happening is 0.23, then $P(\bar{E}) =$ _____

13. All concentric circles are _____ to each other.

14. The probability of an event that is sure to happen, is _____

15. AOBC is a rectangle whose three vertices are A(0, -3), O(0, 0) and B(4, 0). The length of its diagonals is _____.

Answer the following question numbers 16 to 20

16. Write the value of $\sin^2 30^\circ + \cos^2 60^\circ$

17. Form a quadratic polynomial, the sum and product of whose zeroes are (-3) and 2 respectively.

(OR)

Can $(x^2 - 1)$ be a remainder while dividing $x^4 - 3x^2 + 5x - 9$ by $(x^2 + 3)$?

18. Find the sum of the first 100 natural numbers.

19. The LCM of two numbers is 182 and their HCF is 13. If one of the numbers is 26, find the other

20. In figure - 4, the angle of elevation of the top of a tower from a point C on the ground, which is 30 m away from the foot of the tower, is 30° . Find the height of the tower.

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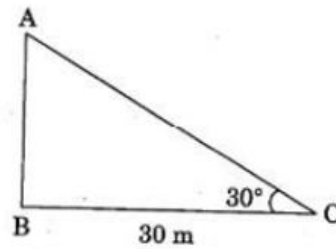


Figure-4

SECTION – B

Question numbers 21 to 26 carry 2 marks each.

21. A cone and a cylinder have the same radii but the height of the cone is 3 times that of the cylinder. Find the ratio of their volumes.
22. In figure – 6, a quadrilateral ABCD is drawn to circumscribe a circle. Prove that $AB + CD = BC + AD$.

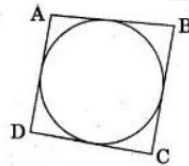


Figure-6

(OR)

In figure – 7, find the perimeter of $\triangle ABC$, if $AP = 12$ cm.

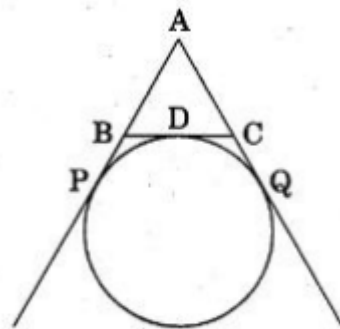


Figure-7

23. Find the mode of the following distribution:

Marks:	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50	50 – 60
Number of students:	4	6	7	12	5	6

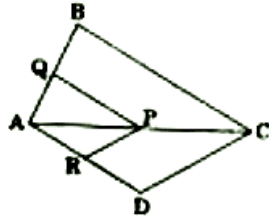
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24. In Figure-7, If $PQ \parallel BC$ and $PR \parallel CD$, Prove that $\frac{QB}{AQ} = \frac{DR}{AR}$



25. Show that $5 + 2\sqrt{7}$ is an irrational number, where $\sqrt{7}$ is given to be an irrational number.
26. If A, B and C are interior angles of a ΔABC , then show that $\cos\left(\frac{B+C}{2}\right) = \sin\left(\frac{A}{2}\right)$.

SECTION - C

27. Prove that:

$$(\sin^4 \theta - \cos^4 \theta + 1) \operatorname{cosec}^2 \theta = 2$$

28. Find the sum: $(-5) + (-8) + (-11) + \dots + (-230)$

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

(OR)

Draw a circle of radius 3.5 cm. Take a point P outside the circle at a distance of 7 cm from the centre of the circle and construct a pair of tangents to the circle from that point.

30. In Figure-B, ABCD is a parallelogram, A semicircle with centre O and the diameter AB has been drawn and it passes through D. If $AB = 12$ cm and $OD \perp AB$, then find, the area of the shaded region. (use $\pi = 3.14$)
31. Read the following passage and answer the questions given at the end :

Diwali Fair

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A game in a booth at a Diwali Fair involves using a spinner first. Then, if the spinner stops on an even number, the player is allowed to pick a marble from a bag. The spinner and the marbles in the bage are respresented in Figure - 8. Prizes are given, when a black marbles is picked. Shweta plays the same once.

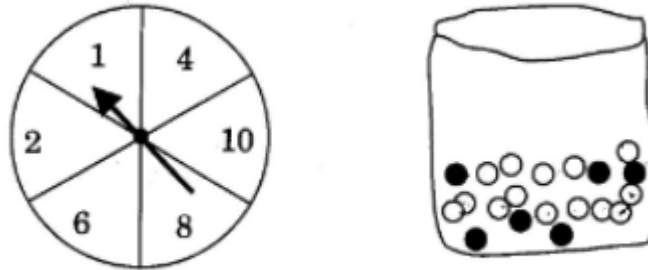


Figure-8

- (i) What is the probability that she will be allowed to pick a marble from the bag ?
(ii) Suppose she is allowed to pick a marble from the bag, what is the probability of getting a prize, when it is given that the bag contains 20 balls out of which 6 are black ?

32. A fraction becomes $\frac{1}{3}$ when 1 is subtracted from the numerator and it becomes $\frac{1}{4}$ when 8 is added to its denominator. Find the fraction.

(OR)

The present age of a father is three years more than three times the age of his son. Three years hence the father's age will be 10 years more than twice the age of the son. Determine their present ages.

33. Find the ratio in which the y-axis divides the line segment joining the points (6, -4) and (-2, -7). Also find the point of intersection.

(OR)

Show that the points (7, 10), (-2, 5) and (3, -4) are vertices of an isosceles right triangle.

34. Use Euclid Division Lemma to show that the square of any positive integer is either of the form $3q$ or $3q + 1$ for some integer q .

SECTION – D

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Question numbers 35 to 40 carry 4 marks each.

35. Some of the areas of two squares is 544 m^2 . If the difference of their perimeter is 32 m, find the sides of the two squares.

(OR)

A motor boat whose speed is 18 km/h in still water takes 1 hour more to go 2 km upstream than to return downstream to the same spot. Find the speed of the stream.

36. The distribution given below shows the number of wickets taken by bowlers in one-day cricket matches. Find the mean and the median of the number of wickets taken.

37. A statue 1.6m 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 elevation of the top of the pedestal is 45° . Find the height of the pedestal.

(Use $\sqrt{3} = 1.73$)

38. Obtain other zeroes of the polynomial $p(x) = 2x^4 - x^3 - 11x^2 + 5x + 5$ if two of its zeroes are $\sqrt{5}$ and $-\sqrt{5}$.

(OR)

What minimum must be added to $2x^3 - 3x^2 + 6x + 7$ so that the resulting polynomial will be divisible by $x^2 - 4x + 8$?

39. In a cylindrical vessel of radius 10 cm, containing some water, 9000 small spherical balls are dropped which are completely immersed in water which raises the water level. If each spherical ball is of radius 0.5 cm, then find the rise in the level of water in the vessel.

40. If a line is drawn parallel to one side of a triangle to intersect other two sides at distinct points, prove that other two sides are divided in the same ratio.