MATHEMATICS

Class XI

Sample Paper—1

Max. Marks: 50   **Time Allowed: 90 minutes**

General Instructions:
   (i) This question paper consists of 45 questions in 5 sections.
  (ii) All questions are compulsory.
 (iii) Section A consists of 10 Multiple Choice Questions carrying 01 mark each.
  (iv) Section B consists of 10 Fill in the Blanks Type Questions carrying 01 mark each.
   (v) Section C consists of 10 True or False Statement Type Questions carrying 01 mark each.
  (vi) Section D consists of 10 Very Short Answer Type Questions carrying 01 marks each.
 (vii) Section E consists of 5 Short Answer Type Questions carrying 02 marks each.

Section A

Select and write one most appropriate option out of the four options given for each of the questions 1 – 10.

1. A quadratic equation $ax^2 + bx + c = 0$, $a \neq 0$ will have real and equal roots if
   (a) $b^2 - 4ac > 0$ (b) $b^2 - 4ac \geq 0$
   (c) $b^2 - 4ac < 0$ (d) $b^2 - 4ac = 0$

2. If $p = -7$, $q = 12$ and $x^2 + px + q = 0$, then value of x is
   (a) $-3, -4$ (b) $3, -4$
   (c) $3, 4$ (d) $-3, 4$

3. In the figure, which one of the following is true?

   (a) $\angle ABC = 90°$ (b) $\angle ACB = 55°$

   (c) both (a) and (b)   (d) none of these

4. In the figure, if BC = CD, then, the value of x is

   (a) 60°   (b) 50°

   (c) 70°   (d) 40°

5. In the figure, if TPT′ represents a tangent to the given circle, then, the value of x is

   (a) 4   (b) 3

   (c) 6   (d) none of these

6. The value of (sin 45° + cos 45°) is

(a) 1

(b) $\dfrac{1}{\sqrt{2}}$

(c) $\dfrac{\sqrt{3}}{2}$

(d) $\sqrt{2}$

7. If cos θ = $\dfrac{4}{5}$, then the value of sin θ is

(a) $\dfrac{3}{5}$

(b) $\dfrac{1}{2}$

(c) $\dfrac{3}{4}$

(d) $\dfrac{1}{5}$

8. A pole 6 m high casts a shadow $2\sqrt{3}$ m long on the ground, then the Sun's elevation is

(a) 60°

(b) 45°

(c) 30°

(d) 90°

9. Which of the following cannot be the probability of an event ?

(a) 0

(b) 1

(c) $\dfrac{1}{4}$

(d) $\dfrac{5}{4}$

10. In a single throw of a die, the probability of getting a prime number is

(a) $\dfrac{1}{2}$

(b) $\dfrac{1}{3}$

(c) $\dfrac{1}{4}$

(d) $\dfrac{1}{5}$

Section B

Fill in the blanks with the correct answer for each of the questions 11 – 20.

11. The zeroes of the quadratic function $f(x) = 2x^2 + 5x - 3$ are _____ .

12. The quadratic equation $ax^2 + bx + c = 0$ has no real roots if _____ .

13. If a, the coefficient of x^2, is positive in the function $f(x) = ax^2 + bx + c$, the parabola is like a cup and opens_____ .

14. Equal chords or arcs of a circle subtend equal angles at the _____ of a circle.

15. The tangent at any point of a circle and the radius through the point are _____ to each other.

16. If two tangents are drawn from an external point to a circle, then the tangents are _____ in length.

17. _____ of a line measures the steepness of a line.

18. While labelling the side of a right angle triangle for an acute angle, the side facing an acute angle under consideration is called the _____ side to that angle.

19. The probability of not getting an even number when a die is thrown is _____ .

20. Probability of drawing a blue ball from a pack of red and black balls is _____ .

Section C

State whether the following statements are true or false for each of the questions 21 – 30.

21. If $b^2 - 4ac > 0$, then the two roots are real and unequal. ☐

22. If the product of two algebraic expressions is zero, then at least one of the factors is equal to zero. ☐

23. 0.2 is a root of the equation $x^2 - 0.4 = 0$. ☐

24. The circumference of a circle is $2\pi d$, where 'd' is the diameter of the circle. ☐

25. A continuous part of a circle is called an arc of the circle. ☐

26. All diameters of a circle are not equal in length. ☐

27. The angle of inclination of line with positive x-axis is tan m, where m is the slope of line. ☐

28. The value of $\tan^{-1}(1)$ is 45°. ☐

29. The experimental probability of an event is a negative number. ☐

30. The probability of occurrence of an impossible event is 0. ☐

Section D

Answer each of the questions 31 – 40.

31. Solve: $6x^2 - x - 2 = 0$

32. Find the quadratic equation having the following roots: –5 and –12.

33. The large hand of a clock is 42 cm long. How many centimetres does its extremity move in 20 minutes? (use $\pi = \dfrac{22}{7}$)
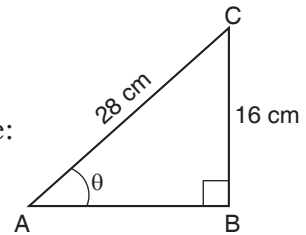
34. Find the area of the shaded region in the given figure.
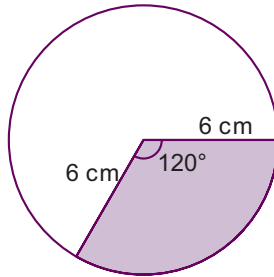
35. In the figure, area of the rectangle is 154 cm^2. Find the value of x.
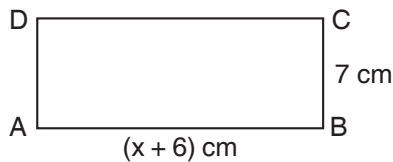

36. Find the angle marked in the following figure:

37. What is the angle of elevation of a vertical flagstaff of height 80 m from a point 68 m from its fort?

38. Find the value of tan 315°. Use a calculator to verify your answer.

39. A bag contains 5 red and 4 black balls. A ball is drawn at random from the bag. What is the probability of getting a black ball?

40. One card is drawn at random from a well-shuffled deck of 52 cards. What is the probability of drawing a king?

Section E

Answer each of the questions 41 – 45.

41. Represent the following situation in the form of a quadratic equation. Albert mother is 26 years older than him. The product of their ages (in years) 3 years from now will be 360. We would like to find Albert present age.

42. In the figure, ∠ATO = 40°. Find the value of ∠AOB.
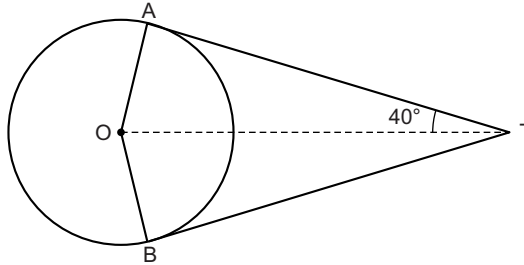
43. In the figure, BC is a chord of the circle with centre O and BT is the tangent to the circle at B. If ∠OCB = 32°, find x and y.
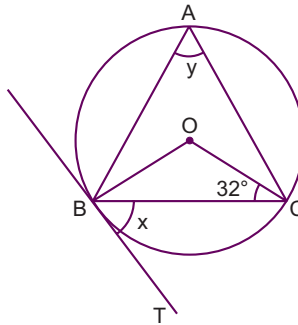
44. Given cos A = $\dfrac{4}{5}$, find sin A and tan A.

45. A number is chosen at random from the set

S = {4, 7, 10, 13, 16, 19}.

What is the probability that the number is

(*i*) even (*ii*) odd

(*iii*) greater than 10 (*iv*) less than 10

(*v*) between 4 and 19