1. 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. $x^3 - 4x - 3$
2. In Figure-1, ABC is an isosceles triangle, right-angled at C. Therefore

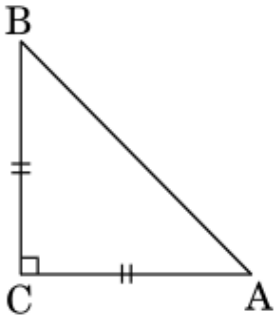


*Figure-1*

   A. $AB^2 = 2AC^2$
   B. $BC^2 = 2AB^2$
   C. $AC^2 = 2AB^2$
   D. $AB^2 = 4AC^2$
3. 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. (0,72)(0,72)
   D. (4,72)(4,72)

4. The value(s) of k for which the quadratic equation $2x^2 + kx + 2 = 0$ has equal roots, is

   A. 4
   B. ±±4
   C. -4
   D. 0

5. Which of the following is not an A.P.?

   A. – 1·2, 0·8, 2·8, ...
   B. 3, 3 + $2-\sqrt{2}$, 3 + $22-\sqrt{2}$, 3 + $32-\sqrt{32}$, ...
   C. $43,73,93,12343,73,93,123,....$
   D. $-15,-25,-35-15,-25,-35,....$

6. The pair of linear equations
   $3x2+5y33x2+5y3$ = 7 and 9x + 10y = 14 is

   A. consistent
   B. inconsistent
   C. consistent with one solution
   D. consistent with many solutions

7. In Figure-2, PQ is tangent to the circle with centre at O, at the point B. If ∠∠AOB = 100°, then ∠∠ABP is equal to

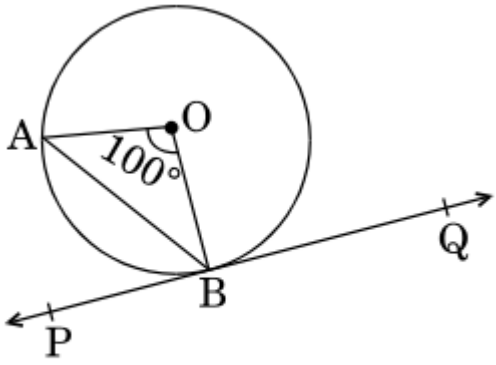


*Figure-2*

   A. 50°
   B. 40°
   C. 60°
   D. 80°

8. The radius of a sphere (in cm) whose volume is $12\pi\pi$ $cm^3$, is

   A. 3
   B. $33–\sqrt{33}$
   C. $32/332/3$
   D. $31/331/3$

9. The distance between the points (m, – n) and (– m, n) is

   A. $m2+n2–––––––\sqrt{m2+n2}$
   B. m + n
   C. $2m2+n2–––––––\sqrt{2m2+n2}$
   D. $2m2+2n2––––––––\sqrt{2m2+2n2}$

10. In Figure-3, from an external point P, two tangents PQ and PR are drawn to a circle of radius 4 cm with centre O. If ∠∠QPR = 90°, then length of PQ is

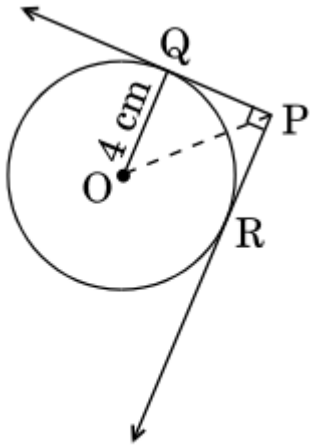


*Figure-3*

   A. 3 cm
   B. 4 cm
   C. 2 cm
   D. $22–\sqrt{22}$ cm

Fill in the blanks in question numbers 11 to 15.

11. The probability of an event that is sure to happen, is _____.
12. Simplest form of $1+\tan2A1+\cot2A1+\tan2\{f0\}A1+\cot2\{f0\}A$ is _____.

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

14. In the formula $\bar{x}x^{-} = a + (\sum f_i u_i \sum f_i) \times h(\sum f_i u_i \sum f_i) \times h$, $u_i$ = _____.

15. All concentric circles are _____ to each other.

Answer the following question numbers 16 to 20.

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

17. 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 $30^{\circ}$. Find the height of the tower.

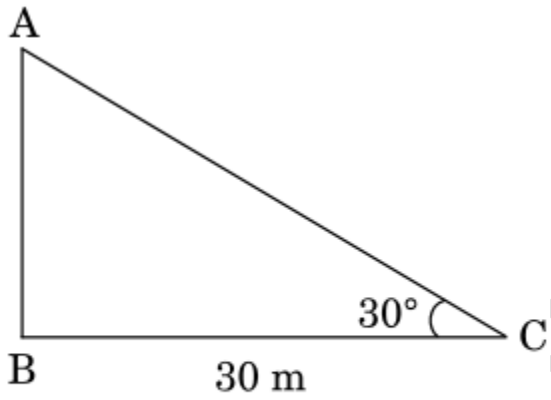


*Figure-4*

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

19. 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 $(x^2 + 3)$? Justify your answer with reasons.

20. Evaluate: $2\tan 45^{\circ} \times \cos 60^{\circ} \sin 30^{\circ}$ 2tan⁡45∘×cos⁡60∘sin⁡30∘

## SECTION B

Question numbers 21 to 26 carry 2 marks each.

21. In the given Figure-5, DE ‖ AC and DF ‖ AE.
Prove that $\frac{BF}{FE} = \frac{BE}{EC}$.

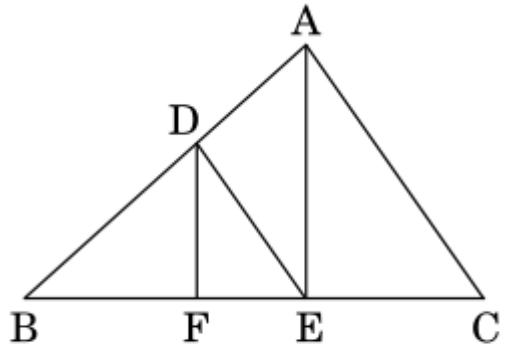


*Figure-5*

22. Show that $5 + 7\sqrt{7}$ is an irrational number, where $7\sqrt{7}$ is given to be an irrational number.

**OR**

Check whether 12n can end with the digit 0 for any natural number n.

23. If A, B and C are interior angles of a △ABC, then show that
$\cos\left(\frac{B+C}{2}\right) = \sin\left(\frac{A}{2}\right)$.

24. In Figure-6, a quadrilateral ABCD is drawn to circumscribe a circle.
Prove that
AB + CD = BC + AD.

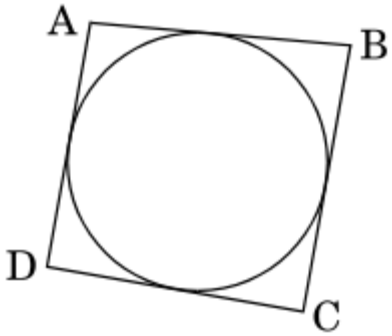


*Figure-6*

**OR**

In Figure-7, find the perimeter of △△ABC, if AP = 12 cm.

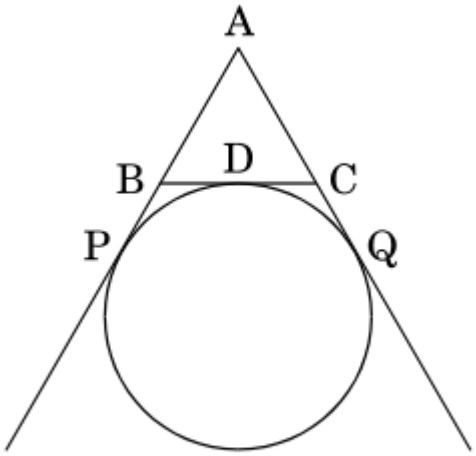


*Figure-7*

25. 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 |

26. 2 cubes, each of volume 125 $cm^3$, are joined end to end. Find the surface area of the resulting cuboid.

**SECTION C**

Question numbers 27 to 34 carry 3 marks each.

27. A fraction becomes $\frac{13}{13}$ when 1 is subtracted from the numerator and it becomes $\frac{14}{14}$ 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.

28. 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.

29. 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.

30. Prove that:

$\frac{1+\sin A}{1-\sin A}$ $\sqrt{\phantom{x}}$ $1+\sin^2 A$ $1-\sin^2 A$ = sec A + tan A

31. For an A.P., it is given that the first term (a) = 5, common difference (d) = 3, and the nth term ($a_n$) = 50. Find n and sum of first n terms ($S_n$) of the A.P.

32. Construct a △△ABC with sides BC = 6 cm, AB = 5 cm and ∠∠ABC = 60°. Then construct a triangle whose sides are $\frac{3}{4}$ of the corresponding sides of △△ABC.

**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.

33. Read the following passage and answer the questions given at the end:

**Diwali Fair**

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 bag are represented in Figure-8.

Prizes are given, when a black marble is picked. Shweta plays the game

once.

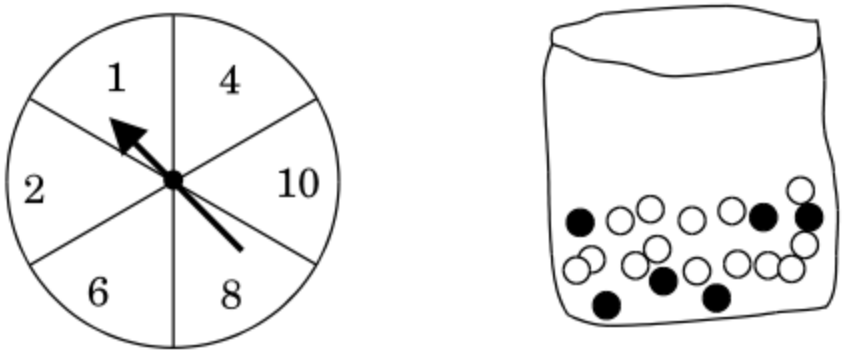


*Figure-8*

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?

34. In Figure-9, a square OPQR is inscribed in a quadrant OAQB of a circle.

If the radius of circle is $62-\sqrt{62}$ cm, find the area of the shaded region.

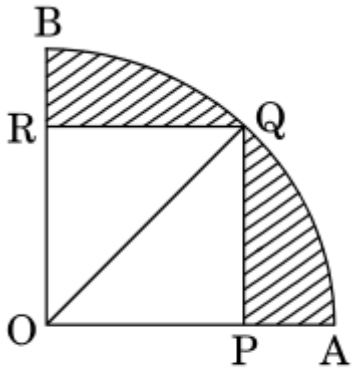


*Figure-9*

## SECTION D

Question numbers 35 to 40 carry 4 marks each.

35. Obtain other zeroes of the polynomial
$p(x) = 2x^4 - x^3 - 11x^2 + 5x + 5$
if two of its zeroes are 5 and – 5.

**OR**

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

36. Prove that the ratio of the areas of two similar triangles is equal to the square of the ratio of their corresponding sides.

37. Sum of the areas of two squares is 544 m2. If the difference of their perimeters is 32 m, find the sides of the two squares.

**OR**

A motorboat whose speed is 18 km/h in still water takes 1 hour more to go 24 km upstream than to return downstream to the same spot. Find the speed of the stream.

38. A solid toy is in the form of a hemisphere surmounted by a right circular cone of same radius. The height of the cone is 10 cm and the radius of the base is 7 cm. Determine the volume of the toy. Also find the area of the coloured sheet required to cover the toy.
(Use $\pi = \frac{22}{7}$ and $\sqrt{149} = 12.2$)

39. A statue 1·6 m 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 $60^\circ$ and from the same point the angle of elevation of the top of the pedestal is $45^\circ$. Find the height of the pedestal. (Use $\sqrt{3} = 1.73$)

40. For the following data, draw a 'less than' ogive and hence find the median of the distribution.

| Age (in years) : | 0 – 10 | 10 – 20 | 20 – 30 | 30 – 40 | 40 – 50 | 50 – 60 | 60 – 70 |
|---|---|---|---|---|---|---|---|
| Number of persons : | 5 | 15 | 20 | 25 | 15 | 11 | 9 |

**OR**

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.

| Number of wickets : | 20 – 60 | 60 – 100 | 100 – 140 | 140 – 180 | 180 – 220 | 220 – 260 |
|---|---|---|---|---|---|---|
| Number of bowlers : | 7 | 5 | 16 | 12 | 2 | 3 |