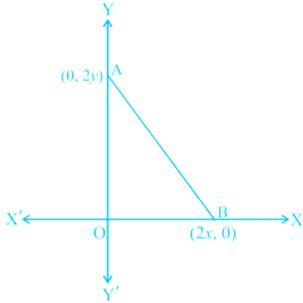


- c) None of these d) $(\frac{4}{5}, 0)$

5. The pair of equations $x = a$ and $y = b$ graphically represents lines which are [1]

- a) intersecting at (b, a) b) coincident
 c) intersecting at (a, b) d) parallel

6. The coordinates of the point which is equidistant from the three vertices of a $\triangle AOB$ as shown in the figure is [1]



- a) $(\frac{x}{2}, \frac{y}{2})$ b) (y, x)
 c) $(0, 0)$ d) (x, y)

7. A die is thrown twice. The probability that 5 will come up at least once is [1]

- a) $\frac{11}{36}$ b) 0
 c) 1 d) $\frac{25}{36}$

8. A sphere is placed inside a right circular cylinder so as to touch the top, base and lateral surface of the cylinder. [1]

If the radius of the sphere is r , then the volume of the cylinder is

- a) $2\pi r^3$ b) $8\pi r^3$
 c) $\frac{8}{3}\pi r^3$ d) $4\pi r^3$

9. From the letters of the word MOBILE, a letter is selected. The probability that the letter is a vowel, is [1]

- a) $\frac{3}{7}$ b) $\frac{1}{6}$
 c) $\frac{1}{2}$ d) $\frac{1}{3}$

10. $x^2 - 6ax = -6a^2$ discriminant of the given equation is _____ [1]

- a) $12a^2$ b) $4a^2$
 c) $6a^2$ d) $2a^2$

11. A quadratic equation $ax^2 + bx + c = 0$, has coincident roots, if [1]

- a) $b^2 - ac = 0$ b) $b^2 - 4ac < 0$
 c) $b^2 - 4ac > 0$ d) $b^2 - 4ac = 0$

12. $\frac{1 + \tan^2 \theta}{\sec^2 \theta} =$ [1]

- a) $\sec^2 \theta$ b) 1
 c) $\frac{1}{\sin^2 \theta - \cos^2 \theta}$ d) $\frac{1}{3}$

13. $2 - \sqrt{3}$ is [1]

- a) an irrational number b) an integer

- c) a rational number d) a whole number
14. If the point R(x, y) divides the join of P(x₁, y₁) and Q(x₂, y₂) internally in the given ratio m₁ : m₂, then the coordinates of the point R are [1]
- a) $\left(\frac{m_2x_1 - m_1x_2}{m_1 + m_2}, \frac{m_2y_1 - m_1y_2}{m_1 + m_2}\right)$ b) $\left(\frac{m_2x_1 - m_1x_2}{m_1 - m_2}, \frac{m_2y_1 - m_1y_2}{m_1 - m_2}\right)$
- c) $\left(\frac{m_2x_1 + m_1x_2}{m_1 + m_2}, \frac{m_2y_1 + m_1y_2}{m_1 + m_2}\right)$ d) None of these
15. If the elevation of the sun changes from 30° to 60° then the difference between the lengths of shadows of a pole 15 m high, is [1]
- a) $5\sqrt{3}$ m b) 15 m
- c) $10\sqrt{3}$ m d) 7.5 m
16. The mean of all the factors of 24 is [1]
- a) 7.5 b) 7
- c) 6.5 d) 24
17. If HCF (26,169) = 13, then LCM (26,169) = [1]
- a) 13 b) 26
- c) 52 d) 338
18. The graphs of the equations 6x - 2y + 9 = 0 and 3x - y + 12 = 0 are two lines which are [1]
- a) perpendicular to each other b) parallel
- c) coincident d) intersecting exactly at one point
19. **Assertion (A):** The HCF of two numbers is 18 and their product is 3072. Then their LCM = 169. [1]
Reason (R): If a, b are two positive integers, then HCF × LCM = a × b.
- a) Both A and R are true and R is the correct explanation of A. b) Both A and R are true but R is not the correct explanation of A.
- c) A is true but R is false. d) A is false but R is true.
20. **Assertion (A):** D and E are points on the sides AB and AC respectively of a $\triangle ABC$ such that $DE \parallel BC$ then the value of x is 4, when AD = x cm, DB = (x - 2) cm, AE = (x + 2) cm and EC = (x - 1) cm. [1]
Reason (R): If a line is parallel to one side of a triangle then it divides the other two sides in the same ratio.
- a) Both A and R are true and R is the correct explanation of A. b) Both A and R are true but R is not the correct explanation of A.
- c) A is true but R is false. d) A is false but R is true.

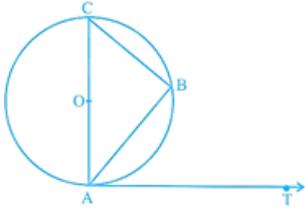
Section B

21. A card is drawn at random from a pack of 52 cards. Find the probability that the card drawn is either a black card or a king. [2]
22. In a competitive examination, one mark is awarded for each correct answer while $\frac{1}{2}$ mark is deducted for every wrong answer. Jayanti answered 120 questions and got 90 marks. How many questions did she answer correctly. [2]
23. Find the zeros of $f(x) = 6x^2 - 3 - 7x$ and verify the relationship between the zeros and its coefficients. [2]
24. Find the coordinates of the point of trisection of the line segment joining the points A(2, - 2) and B(- 7, 4). [2]

OR

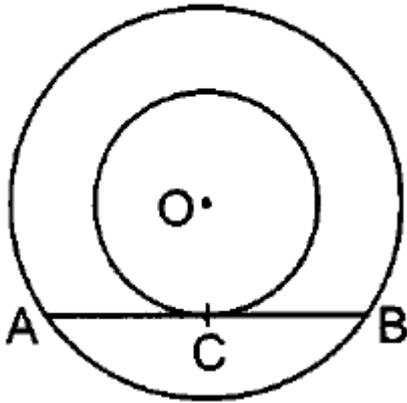
Find the ratio in which the point P (-1, y) lying on the line segment joining A (-3, 10) and B(6, -8) divides it. Also find the value of y.

25. If AB is a chord of a circle with centre O. AOC is a diameter and AT is the tangent at A as shown in figure. [2]
 Prove that $\angle BAT = \angle ACB$.



OR

Prove that the tangent at any point of a circle is perpendicular to the radius through the point of contact. Using the above, do the following: In figure, O is the centre of the two concentric circles. AB is a chord of the larger circle touching the smaller circle at C. Prove that $AC = BC$.



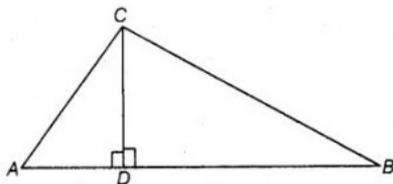
Section C

26. If $\tan \theta + \sec \theta = l$, then prove that $\sec \theta = \frac{l^2 + 1}{2l}$. [3]
 27. Solve $2x + 3y = 11$ and $2x - 4y = -24$ and hence find the value of 'm' for which $y = mx + 3$. [3]
 28. A mason has to fit a bathroom with square marble tiles of the largest possible size. The size of the bathroom is 10 ft. by 8 ft. What would be the size (in inches) of the tile required that has to be cut and how many such tiles are required? [3]

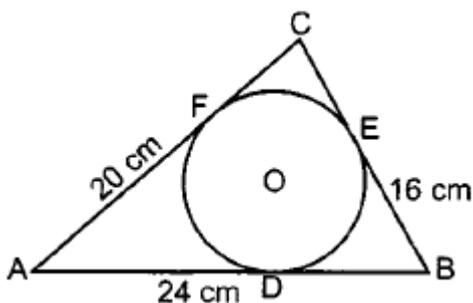
OR

Prove that $2 + \sqrt{5}$ is an irrational number.

29. In figure, if $\angle ACB = \angle CDA$, $AC = 8$ cm and $AD = 3$ cm, find BD . [3]

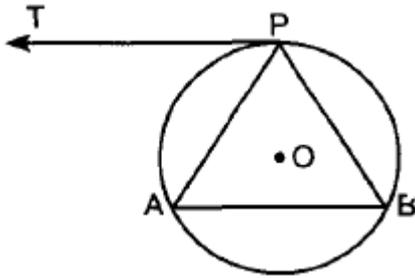


30. A circle is inscribed in a $\triangle ABC$ having sides 16 cm, 20 cm and 24 cm as shown in figure. Find AD , BE and CF . [3]



OR

A tangent PT is drawn parallel to a chord AB as shown in figure. Prove that APB is an isosceles triangle.



31. The length of a string between a kite and a point on the ground is 85 m. If the string makes an angle θ with the ground level such that $\tan \theta = 15/8$ then find the height of the kite from the ground. Assume that there is no slack in the string. [3]

Section D

32. A shopkeeper buys a number of books for Rs.1200. If he had bought 10 more books for the same amount, each book would have cost him Rs.20 less. Find how many books did he buy? [5]

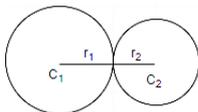
OR

If the roots of the quadratic equation $(c^2 - ab)x^2 - 2(a^2 - bc)x + b^2 - ac = 0$ in x are equal then show that either $a = 0$ or $a^3 + b^3 + c^3 = 3abc$

33. In trapezium ABCD, $AB \parallel DC$ and $DC = 2AB$. $EF \parallel AB$, where E and F lie on BC and AD respectively, such that $\frac{BE}{EC} = \frac{4}{3}$. Diagonal DB intersects EF at G. Prove that $7EF = 11 AB$. [5]
34. Find the difference of the areas of two segments of a circle formed by a chord of length 5 cm subtending angle of 90° at the centre. [5]

OR

Two farmers have circular plots. The plots are watered with the same water source placed in the point common to both the plots as shown in the figure. The sum of their areas is 130π and the distance between their centres is 14 m. Find the radii of the circles. What value is depicted by the farmers?



35. Calculate the median from the following data: [5]

Marks below	10	20	30	40	50	60	70	80
No. of students	15	35	60	84	96	127	198	250

Section E

36. Read the text carefully and answer the questions: [4]

Ashish is a Class IX student. His class teacher Mrs Verma arranged a historical trip to great Stupa of Sanchi. She explained that Stupa of Sanchi is great example of architecture in India. Its base part is cylindrical in shape. The dome of this stupa is hemispherical in shape, known as Anda. It also contains a cubical shape part called

Hermika at the top. Path around Anda is known as Pradakshina Path.



- (i) Find the volume of the Hermika, if the side of cubical part is 10 m.
- (ii) Find the volume of cylindrical base part whose diameter and height 48 m and 14 m.
- (iii) If the volume of each brick used is 0.01 m^3 , then find the number of bricks used to make the cylindrical base.

OR

If the diameter of the Anda is 42 m, then find the volume of the Anda.

37. **Read the text carefully and answer the questions:**

[4]

Saving money is a good habit and it should be inculcated in children from the beginning. Mrs. Pushpa brought a piggy bank for her child Akshar. He puts one five-rupee coin of his savings in the piggy bank on the first day. He increases his savings by one five-rupee coin daily.



- (i) If the piggy bank can hold 190 coins of five rupees in all, find the number of days he can contribute to put the five-rupee coins into it
- (ii) Find the total money he saved.

OR

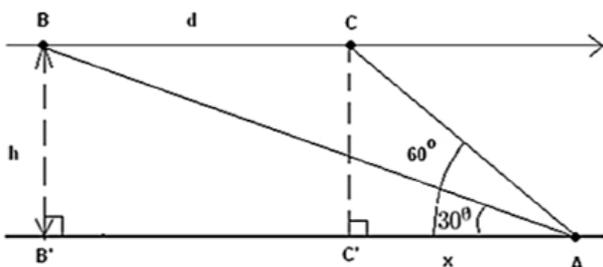
How many coins are there in piggy bank on 15th day?

- (iii) How much money Akshar saves in 10 days?

38. **Read the text carefully and answer the questions:**

[4]

Mr. Vinod is a pilot in Air India. During the Covid-19 pandemic, many Indian passengers were stuck at Dubai Airport. The government of India sent special aircraft to take them. Mr. Vinod was leading this operation. He is flying from Dubai to New Delhi with these passengers. His airplane is approaching point A along a straight line and at a constant altitude h . At 10:00 am, the angle of elevation of the airplane is 30° and at 10:01 am, it is 60° .



- (i) What is the distance d is covered by the airplane from 10:00 am to 10:01 am if the speed of the airplane is constant and equal to 600 miles/hour?
- (ii) What is the altitude h of the airplane? (round answer to 2 decimal places)

OR

Find the distance between passenger and airplane when the angle of elevation is 60° .

(iii) Find the distance between passenger and airplane when the angle of elevation is 30° .

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Priyam Sir