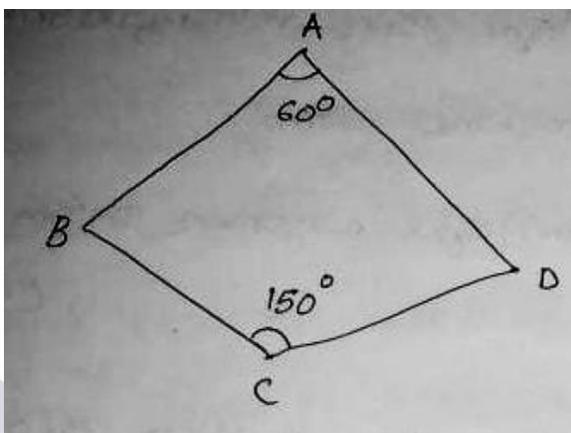




Subject:	MATHEMATICS	Class:	X	Type :	Descriptive	Batch	LOT
No. of Questions:	29	Mark:	80	Time:	2.5 hrs.	Date :	14/05/2020

Answer any three from questions 1 to 4. Each questions carries 2 marks.

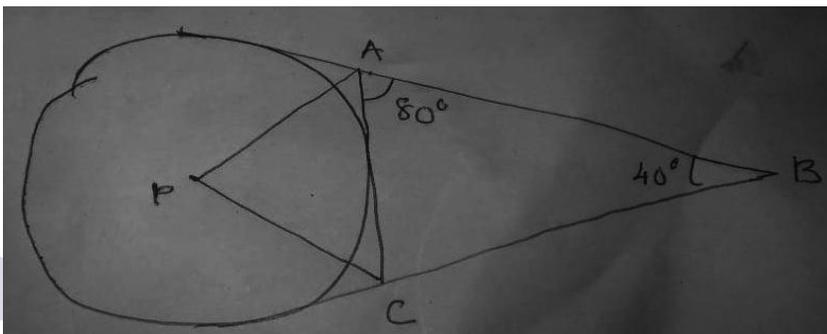
1. In the figure $AB = AD$, $\angle A = 60^\circ$, $\angle C = 150^\circ$ show that the circle centred at A and radius AB



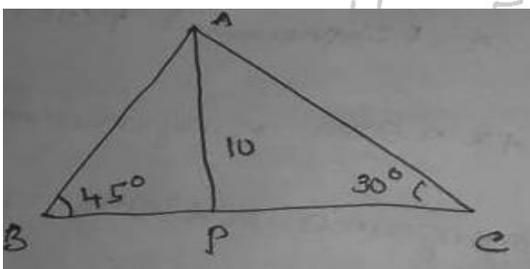
- Passes through the point 'D'?
 - Passes through the point 'C'?
2. The age of 10 members of a club are 20, 25, 22, 32, 42, 27, 35, 27, 35 & 30. Find median age.
3. The algebraic form of AS is $5n + 3$
- What is the first form of the sequence?
 - What will be the remainder if the terms of the sequences are divided by 5?
4. Sum of first n terms of AS is $2n^2 + 3n$
- Find first term
 - Find algebraic form of AS

Answer any 5 from the questions 5 to 11. Each questions carries 3 marks.

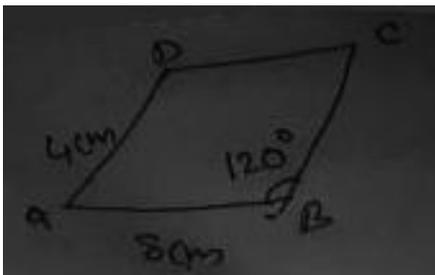
5. Draw a circle with radius 4 cm. draw a triangle with two of its angle 65° and 78° and all vertices on the circle.
6. a) Write the sequence of odd numbers greater than 1.
b) What is the algebraic form of this sequence?
7. Consider the Polynomial $p(x) = x^2 - 4x + 3$
a) Check whether $x - 1$ is a factor of $p(x)$
b) Find $p(2)$, $p(x) - p(2)$
c) Find one factor of polynomial $p(x) - p(2)$
8. In the figure, P is the centre of an ex circle of triangle ABC, if $\angle ABC = 40^\circ$ and $\angle BAC = 80^\circ$. find the angles of triangle APC.



9. In triangle ABC, the length of AP is 10 cm. What is the length of BP? What is the length of PC? Calculate the length of BC?



10. ABCD is a parallelogram. AB = 8 cm AD = 4 cm $\angle B = 120^\circ$.



- a) What is $\angle D$?
- b) What is the perpendicular distance from D to AB?
- c) What is the area of ABCD?

11. Find the slope of line joining (2, 4) and (4, 7). Write the co-ordinate of another point on the line. Check whether (5, 8) is on this line.

Answer any 7 from questions 12 to 21. Each carries 4 marks.

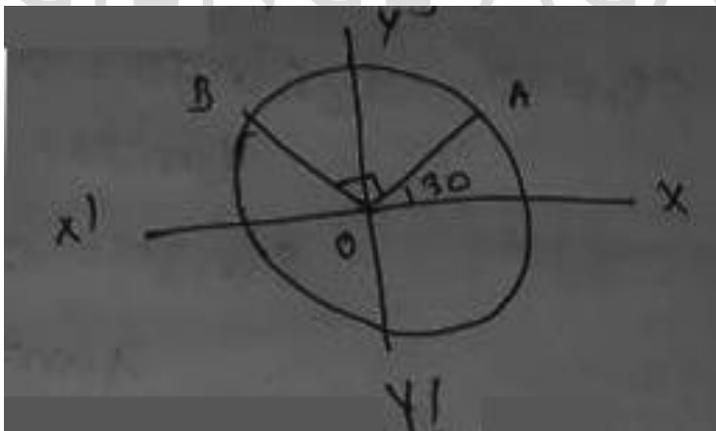
12. One is asked to say a three digit number. What is a probability that

- a) How many three digit numbers?
- b) All the digits of the number are same?
- c) The number is multiple of '6'?

13. The sum of first 9 terms of AS is 45 and sum of first 18 terms is 171.

- a) The sum of its 10th to 18th terms?
- b) What is its 5th term?
- c) Find its 14th term?
- d) Find the sum of 5th to 14th terms?

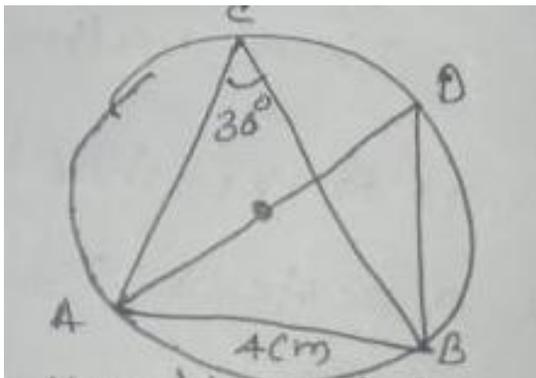
14. In the picture the centre of the circle is the origin. A & B are points on the circle. OA = 6 cm. what is the co-ordinates of A & B?



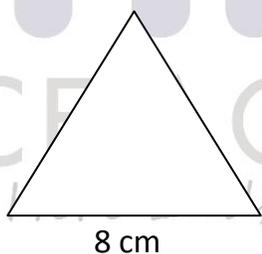
15. If x is a natural number.

- a) What number is to be added to $x^2 + 6x$ to get a perfect square?
- b) If $x^2 + ax + 16$ is a perfect square which number is 'a'?
- c) If $x^2 + ax + 16$ is a perfect square, Prove that $a^2 = 46$

16. In the figure C, D are points on the circle. AD is a diameter of the circle $\angle C = 30^\circ$, $AB = 4$ cm, $\angle A = 70^\circ$, $\angle B = 80^\circ$ ($\sin 70 = 0.93$, $\cos 70 = 0.84$, $\tan 70 = 2.74$, $\sin 80 = 0.98$, $\cos 80 = 0.17$, $\tan 80 = 5.14$)



- $\angle D = ?$
 - $\angle ABD = ?$
 - What is the length of the diameter?
 - What is the length of BC?
17. One lateral face of a square pyramid is giving the picture. If all angles of the triangle in the picture are equal



- What is the length of the edges of the pyramid?
- What is its slant height?
- What is its height?
- What is the ratio of slant height and height?

18. The table below shows the workers in factory sorted according to their daily wages.

Daily wage	Number o workers
300 – 400	4
400 – 500	6
500 – 600	10
600 – 700	8
700 – 800	4
800 – 900	3

- If the workers are arranged in increasing order of daily wages, what is the position of the worker whose wage is median?
- What is assumed to be the daily wages of 11th worker?
- Find the median wage?

19. A(-2, 1), C(10, 10) are two points in a line. B lies b/w A & C. AB : AC = 1 : 3.

- Find length of AB?
- Find the co-ordinates of B?
- Write the equation of AB?
- Find the point where line cut x axis ?

20. In the polynomial $p(x) = x^2 + 6x + k$

- If $k = -10$, prove that $p(x)$ can be written as the product of two first degree polynomials.
- If $k = 10$ prove that $p(x)$ cannot be written as the product of two first degree polynomials.
- What is the largest number k for which $p(x)$ can be written as the product of two first degree polynomials.?

21. The length of one side of a square is 4 cm more than the length of the side of another square. The sum of areas of these two squares is 400 cm^2 . Find the length of the sides of each square?

Answer any 5 from questions 22 to 28. Each carries 5 marks.

22. A man standing on the top of a light house see a ship approaching the sea shore at an angle of depression of 22° . After the ship has travelled 100 m more towards the sea shore, he sees it an angle of depression of 31° . the ship stop there.

- a) Draw a rough sketch.
- b) How far is the ship from the light house?
- c) Find the height of light house?

$$(\tan 22^\circ = 0.4, \tan 31^\circ = 0.6)$$

23. Draw a triangle of sides 6 cm, 7 cm, & 8 cm. Draw a circle which touches all sides of the triangle and measure it radius.

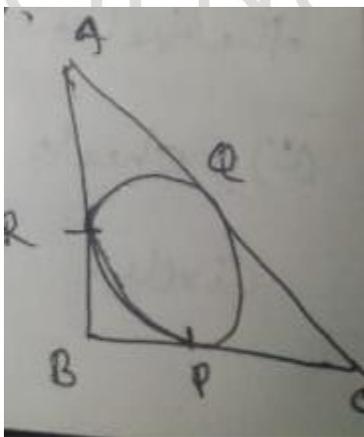
24. A cone is made from sector of radius 10 cm and central angle 216° .

- a) What is the slant height and radius of cone?
- b) Find volume of the cone?

25. A circle with centre (3, 4) passes through the origin.

- a) What is the radius of the circle?
- b) If a point in the circle is (x, y), write the relation b/w x & y?
- c) Check whether the points (-2, 1) lies on this circle?

26. In triangle ABC, AB = 8 cm, BC = 6 cm, $\angle B = 90^\circ$

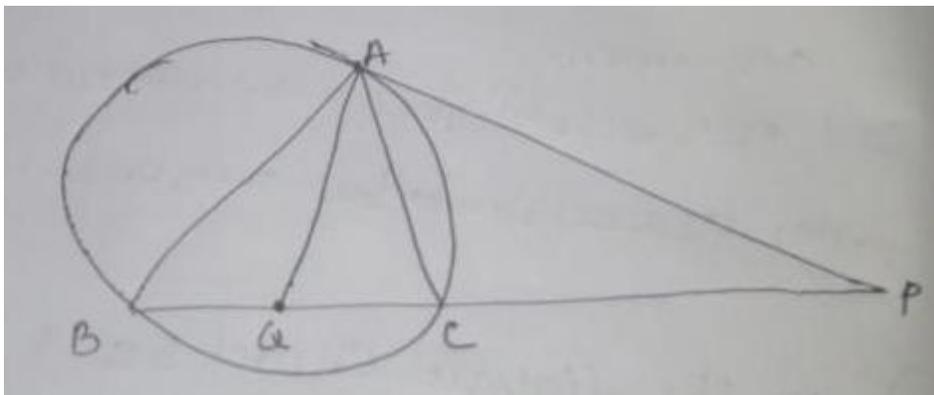


- a) Find the area o triangle ABC?
- b) Find the radius of its incircle?
- c) Find the length of AQ?
- d) Find $AQ \times QC$?

27. Consider the AS 7, 11, 15, ...

- What is its 20th term?
- Find the sum of its first 20 terms.
- Is the sum of any two terms of this sequence will be a term in this sequence. Why?

28. In the figure chord BC is extended to P. PA is the tangent from P. AQ is the bisector of $\angle BAC$.



- Write two pairs of equal angles from the figure?
- IF $\angle PAC = x$ and $\angle PCA = y$
Prove that $\angle BAC = y - x$
- Prove that $\angle PAQ = \frac{x+y}{2}$

29. In the right angle triangle ABC

(6)

$$\sin A = \frac{BC}{AC}, \cos A = \frac{AB}{AC}$$

$$(\sin A)^2 + (\cos A)^2 = \left(\frac{BC}{AC}\right)^2 + \left(\frac{AB}{AC}\right)^2$$

$$= \frac{BC^2 + AB^2}{AC^2} = \frac{AC^2}{AC^2} = 1$$

$$(\sin A)^2 + (\cos A)^2 = 1$$

This can be written as $\sin^2 A + \cos^2 A = 1$

Similarly $\sin^2 C + \cos^2 C = 1$

In general for any x $\sin^2 x + \cos^2 x = 1$

- a) $\sin^2 30 + \cos^2 3 = \dots\dots\dots?$
- b) $\sin^2 50 + \cos^2 50 = \dots\dots\dots?$
- c) $\sin^2 40 = 1 - \cos^2 x$. then $x = \dots\dots\dots?$
- d) $1 - \sin^2 x = \cos^2 70$. then $x = \dots\dots\dots?$
- e) If $\sin A = k$. then $\cos A = \dots\dots\dots?$
- f) If $\cos A = P$, then $\sin A = \dots\dots\dots?$

