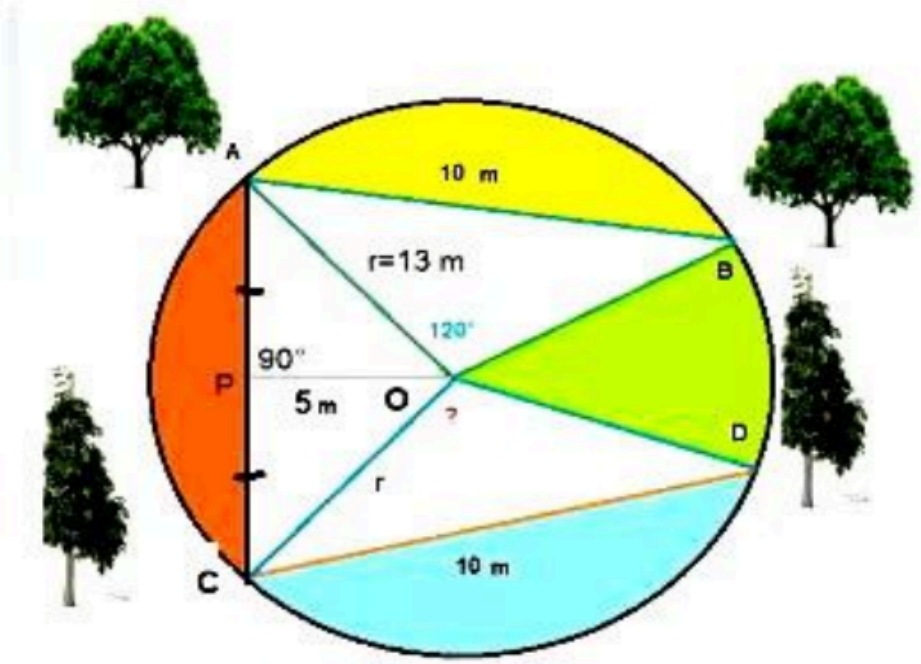
CBT EXAM-DECEMBER-2024-25

CHAPTERS- CIRCLES,AREA(HERONS FORMULA)

CLASS-IX (MATHS)

A farmer has a circular garden as shown in the picture, which has different types of trees, plants and flowers. In the garden there are two mango trees A and B such that AB = 10m. Similarly there are two ashoka trees C and D at the same distance 10m. AB subtends 120^0 at the centre O and AC is at a distance of 5m from the centre. The radius of the circle is 13m.



1. What is the angle subtended by CD at the centre O?

(A) 60°
(B) 100°
(C) 120°
(D) 80°
ANS: (C) 120°
Equal chords subtend equal angles at the centre.$\angle AOB = \angle OCD$ =120°
2. What is the distance between mango tree A and ashoka tree C?
(A) 12 m
(B) 24 m
(C) 13 m
(D) 5 m
ANS: (B) 24 m
In right angled ΔOAP ,$OA^2 = AP^2 + OP^2 \Rightarrow 13^2 = AP^2 + 5^2 \Rightarrow$ AP = 12 m
AC = 2 ×12 m = 24 m
3.Find ∠OAB
(A) 60°
(B) 30°

(C) 120°
(D) 80°
ANS: (B) 30°
$\angle OAB = \angle OBA =$ (OA=OB)

$\angle OAB + \angle OBA + 120° = 180°$ Angle sum property in $\triangle OAB$
$\angle OAB + \angle OAB + 120° = 180° \Rightarrow 2\angle OAB = 60°$
$\angle OAB = 30°$

4. Find ∠OCD
(A) 60°
(B) 30°
(C) 120°
(D) 80°
ANS: (B) 30°
$\angle OCD = \angle ODC =$ (OC=OD)

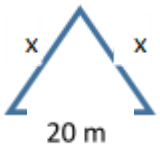
$\angle OCD + \angle ODC + 120° = 180°$ Angle sum property in $\triangle OCD$
$\angle OCD + \angle ODC + 120° = 180° \Rightarrow 2\angle OCD = 60°$
$\angle OCD = 30°$

5. What is the area of $\triangle OAC$?

(A) 120 sq. cm
(B) 60 sq. cm
(C) 100 sq. cm
(D) 150 sq. cm
ANS: (B) 60 sq. cm
area of $\triangle OAC$ = ½ × AC × OP = ½ × 24 × 5 = 60 sq. cm

Triangles are used to make bridges because a triangle is an undeformed shape,is considered in the civil engineering field. it can hold the most force when applied to it, compared to quadrilaterals and arches. isosceles triangles were used to construct a bridge in which the base (unequal sides) of an isosceles triangle is 4m and its perimeter is 20m

6. What is the length of equal sides ?



(A) 2 m
(B) 3 m
(C) 8 m
(D) 10 m
ANS: (C) 8 m
x + x + 12 =20 ⇒ x= 8 m

7. What is the Heron's formula for a triangle ?
(A) $\sqrt{s(s+a)(s-b)(s-c)}$
(B) $\sqrt{s(s-a)(s+b)(s-c)}$
(C) $\sqrt{s(s-a)(s-b)(s+c)}$
(D) $\sqrt{s(s-a)(s-b)(s-c)}$
ANS: (D) $\sqrt{s(s-a)(s-b)(s-c)}$
Area of triangle = $\sqrt{s(s-a)(s-b)(s-c)}$

8. What is the semi perimeter of the highlighted triangle ?
(A) 30 m
(B) 40 m
(C) 10 m
(D) 50 m
ANS:
(C) 10 m
20/2 =10 m

9. What is the area of highlighted triangle ?
(A) $4\sqrt{15}$ m^2
(B) 4 m^2
(C) $\sqrt{15}$ m^2
(D) 20 m^2
ANS: (A) $4\sqrt{15}$ m^2
s = 10 m
Area of triangle = $\sqrt{10(10-4)(10-8)(10-8)}$ = (A) $4\sqrt{15}$ m^2

10 If the sides of a triangle are in the ratio 3 : 5 : 7 and its perimeter is 300 m. Find its area.
(A) $100\sqrt{2}$
(B) $500\sqrt{3}$
(C) $1500\sqrt{2}$
(D) $1500\sqrt{3}$
ANS: (D) $1500\sqrt{3}$
Let the sides of triangle are 3x, 5x and 7x
3x +5x + 7x= 300 ⇒ x =20 m
Sides are 60 m,100 m ,140 m and s= 150 m
Area of triangle = $\sqrt{150(150-60)(150-100)(150-140)}$=
= $\sqrt{150 \times 90 \times 50 \times 10}$ = $1500\sqrt{3}$ m^2