CLASS 10 MATHS EXTRA QUESTIONS

Class 10 Maths Chapter 11 Areas Related to Circles Extra Questions (HOTS)

Genuinely harder, HOTS-level practice for Class 10 Maths Chapter 11 (Areas Related to Circles), going beyond Exercise 11.1 with fresh numbers, general proofs, and reverse-engineering problems. These Class 10 Mathematics Chapter 11 important questions are handy for last-minute exam practice.

Contents

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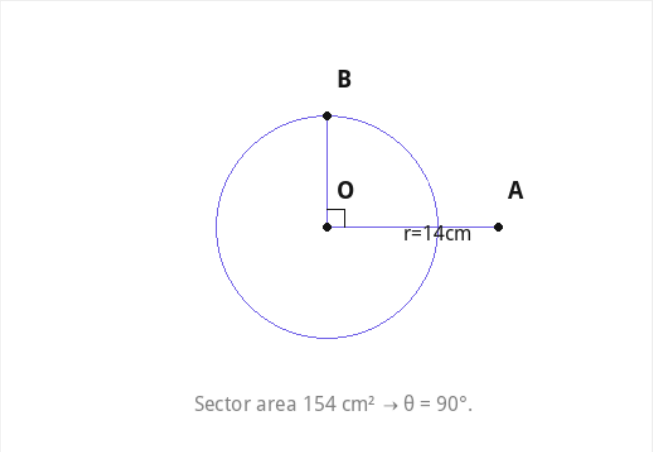
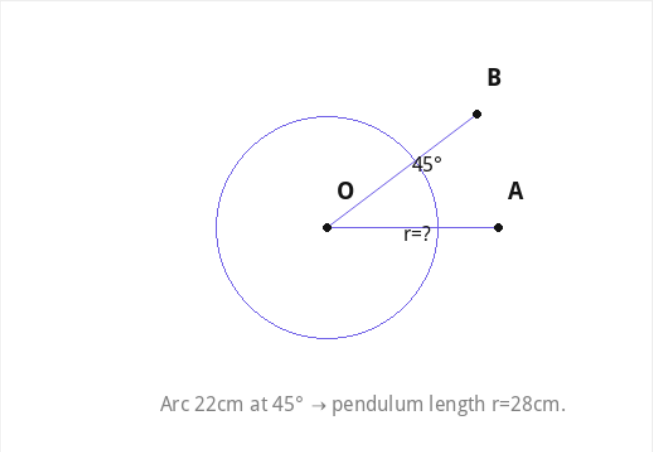
Q1 (General derivation). Derive the general formula for the area of a sector in terms of its arc length l and radius r, starting from the sector-angle formula.
Solution: Arc length $l = (\theta/360) \times 2\pi r \Rightarrow \theta/360 = l/(2\pi r)$. Substituting into Area $= (\theta/360)\pi r^2$ gives Area $= [l/(2\pi r)] \times \pi r^2 =$ **$(1/2) \times l \times r$**. This general result works for any sector without knowing θ directly, as long as the arc length is known.

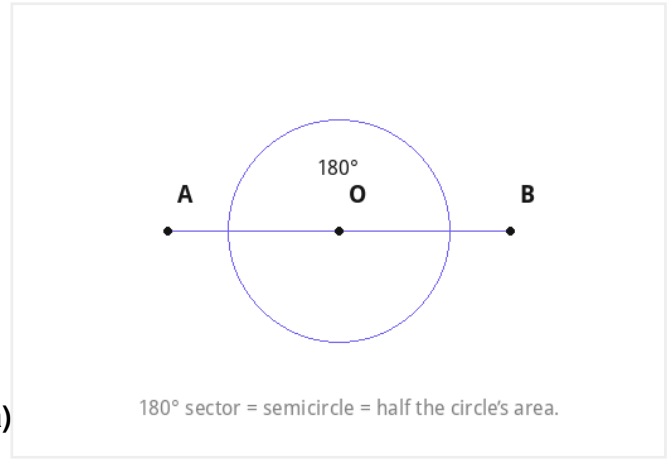
Q2 (Reverse-engineering). The area of a sector of a circle of radius 14 cm is 154 cm^2. Find the angle of the sector.
Solution: $154 = (\theta/360) \times (22/7) \times 196 \Rightarrow \theta = 154 \times 360 \times 7 / (22 \times 196) = 388080/4312 =$ **90°**



Q3 (Fresh-number word problem). A pendulum swings through an angle of 45° and describes an arc of length 22 cm. Find the length of the pendulum.
Solution: $22 = (45/360) \times 2 \times (22/7) \times r = (11/14)r \Rightarrow r = 22 \times 14/11 =$ **28 cm**

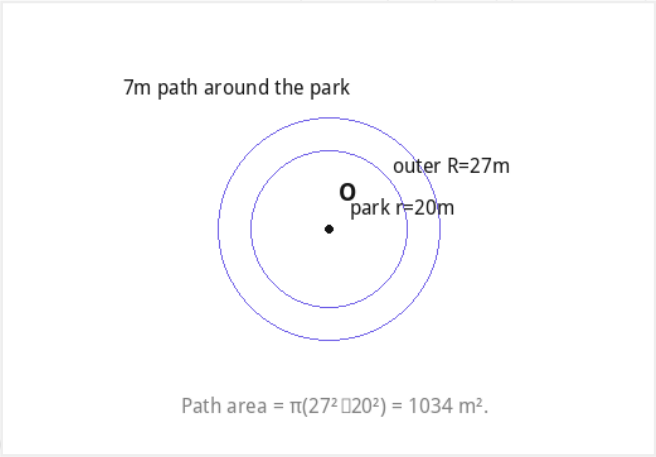


Q4 (Assertion-Reason). Assertion (A): The area of a sector with central angle 180° equals half the area of the circle. Reason (R): A sector with central angle 180° is a semicircle.
(a) Both A and R true, R is the correct explanation of A (b) Both true, R is not the correct explanation (c) A true, R false (d) A false, R true
Solution: Sector area at 180° $= (180/360)\pi r^2 = (1/2)\pi r^2$, exactly half the circle's area, and this is precisely



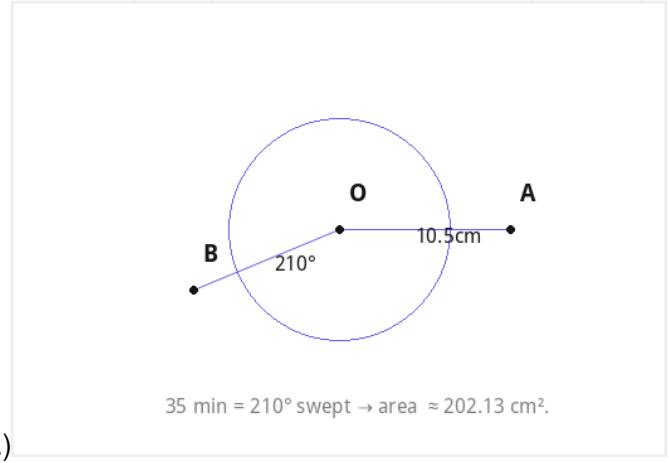
because 180° sweeps a semicircle. **Answer: (a)**

Q5 (Combination of figures, fresh numbers). A circular park of radius 20 m has a 7 m wide path built all around it (outside the park). Find the area of the path, and the cost of gravelling it at ₹50 per m^2.
Solution: Outer radius R = 20 + 7 = 27 m. Path area = $\pi(R^2 - r^2)$ = (22/7)(729 – 400) = (22/7) × 329 = **1034**

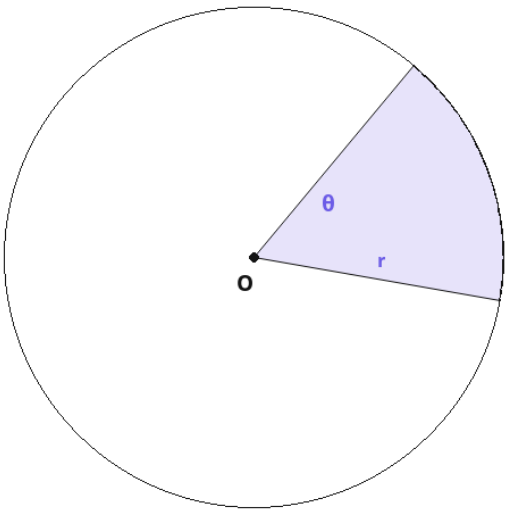


m^2. Cost = 1034 × 50 = **₹51,700**

Q6 (Clock/time HOTS, fresh numbers). The minute hand of a clock is 10.5 cm long. Find the area swept by it between 8:00 a.m. and 8:35 a.m.
Solution: In 35 minutes, angle swept = (35/60) × 360° = 210°. Area = (210/360) × (22/7) × 10.5^2 = (7/12) ×



346.5 = **202.13 cm^2** (approx.)



Sector area = (θ/360) x pi r^2; Arc length = (θ/360) x 2 pi r, where θ is the angle at the centre.

Reference figure — sector of a circle (angle θ, radius r)

Class 10 Mathematics Chapter 11 – Solutions and Notes

For complete step-by-step answers and a quick summary, check the Class 10 Mathematics Chapter 11 Solutions and Class 10 Mathematics Chapter 11 Revision Notes.

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