

Circles arcs and sectors

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Purpose

Calculate circle circumference and area, arc length and sector area, distinguishing curved length from the full sector perimeter.

Vocabulary

Radius: centre to circumference. Diameter: chord through centre. Chord: joins two circumference points. Tangent: line touching at one point. Arc: curved boundary portion. Sector: enclosed by two radii and an arc. Segment: enclosed by chord and arc.

Why the method works

Every circle has circumference divided by diameter equal to π , so $C=\pi d=2\pi r$. Rearranging narrow sectors approaches a rectangle with height r and width πr , explaining area πr^2 . A central angle θ covers $\theta/360$ of a whole circle, so $\text{arc}=(\theta/360)2\pi r$ and $\text{sector area}=(\theta/360)\pi r^2$. A sector perimeter adds two radii to its arc.

Method and checking

Mark radius versus diameter. Decide whether the question asks for length or area. Use the central-angle fraction, retain π or full calculator precision, then round once at the end. Check units and that a minor part is smaller than the whole.

Common errors and next attempt

If diameter is squared in πr^2 , halve it first. If a sector perimeter equals just its arc, trace both straight edges. If $\theta/180$ is used, compare a semicircle with the full 360° . Recheck $r=6$, $\theta=90^\circ$.