

Circles: math test solutions, Grade 10 – download the PDF

Test solutions with the detailed point scale. Add up your points and spot what to review.

Suggested time: 45 minutes. Out of 20 points. Calculator allowed only when the problem says so.

1 Tangents

/ 3 pts

- (a) $OT \perp PT$, so $PT^2 = 15^2 - 9^2 = 144$ and $PT = 12$ cm. (2 pts)
- (b) Tangent segments from the same external point are congruent, so $PS = 12$ cm. (1 pt)

2 Inscribed angles

/ 4 pts

- (a) $\angle ACB$ intercepts $\widehat{AB}$: $84 \div 2 = 42^\circ$. (1 pt)
- (b) $\angle ABD$ intercepts $\widehat{DA}$: $110 \div 2 = 55^\circ$. (1 pt)
- (c) $\angle ABC$ intercepts $\widehat{CD} + \widehat{DA} = 180^\circ$: $m\angle ABC = 90^\circ$, so AC is a diameter. (1 pt)
- (d) $m\angle DAB = \frac{1}{2}(96 + 70) = 83^\circ$ and $m\angle BCD = \frac{1}{2}(110 + 84) = 97^\circ$. $83 + 97 = 180$, so they are supplementary. (1 pt)

3 Arc and sector

/ 4 pts

- (a) $\ell = \frac{48}{360} \cdot 2\pi \cdot 15 = 4\pi \approx 12.57$ cm. (2 pts)
- (b) $A = \frac{48}{360} \cdot \pi \cdot 225 = 30\pi \approx 94.25$ cm². (2 pts)

4 Segment lengths

/ 4 pts

- (a) $8 \cdot 3 = 4 \cdot ED$, so $ED = 6$. (2 pts)
- (b) $6^2 = 4 \cdot w$, so $w = 9$. (1 pt) The chord is $9 - 4 = 5$. (1 pt)

5 Equation of a circle

/ 3 pts

- (a) $(x^2 - 12x + 36) + (y^2 + 4y + 4) = -15 + 36 + 4$, so $(x - 6)^2 + (y + 2)^2 = 25$. (1 pt)
- (b) Center $(6, -2)$, radius 5. (1 pt)
- (c) $(2 - 6)^2 + (1 + 2)^2 = 16 + 9 = 25$, so yes, the point lies on the circle. (1 pt)

6 Angle outside a circle

/ 2 pts

The angle is half the difference of the arcs: $\frac{1}{2}(130 - 46)$ (1 pt) $= 42^\circ$. (1 pt)



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