

Circle Geometry – Answer Sheet

Q1 60°

Q2 (a) 35° (b) 96°

Q3 90°

Q4 85°

Q5 Remaining angles $66^\circ, 114^\circ$

Q6 Exterior = interior opposite (statement proven)

Q7 55°

Q8 7.2 cm

Q9 (a) 90° (b) $FH = HG$

Q10 $PD = 6.75$ cm

Q11 $NX = 8.75$ cm

Q12 Impossible (distance $> r$)

Q13 6.28 cm

Q14 49.1 cm^2

Q15 (a) 2.88 m (b) $\frac{7}{3}$ rad

Q16 $(-1, 1), (3, 9)$

Q17 (1.00, 1.00)

Q18 See sketch: roots at $-2, 0, 1$

Q1 Worked Solution – Two Tangent Circles

Let common external tangents meet at P . Length of each tangent from P is given by

$$PT = \sqrt{d^2 - (r_2 - r_1)^2} = \sqrt{13^2 - (8 - 5)^2} = \sqrt{169 - 9} = 4\sqrt{10} \text{ cm}$$

(a) For circle O_1 (radius 5),

$$PT_1^2 = PO_1^2 - 5^2$$

(b) Same calculation for the second circle (radius 8) gives $PT_2^2 = PO_2^2 - 8^2 = 160$. Hence $PT_1 = PT_2$.

(c) Exact lengths

$$PT_1 = PT_2 = 4\sqrt{10} \approx 12.6 \text{ cm}$$

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