

CIRCLE GEOMETRY REVIEW - ANSWERS

1 a. 36°

b. area = 679 cm^2

c. arc length = 117 cm

d. perimeter = 20.5 cm

2. a. length of chord = 8 cm

b. diameter = 18.9 cm

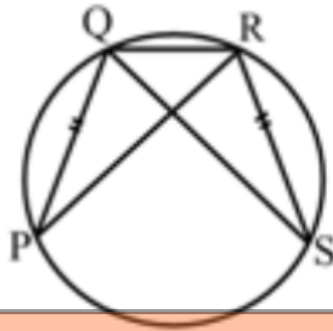
c. distance = 7.1 cm

- 3 a. $x = y = z = 90^\circ$
- b. $x = 80^\circ$
- c. $x = 70^\circ, y = 105^\circ$
- d. $x = 55^\circ, y = 125^\circ$
- e. $x = 8$
- f. $x = y = 80^\circ, z = 20^\circ$
- g. $x = 90^\circ, y = 55^\circ$
- h. $x = 120^\circ, y = 30^\circ$
- i. $x = 140^\circ, y = 220^\circ$
- j. $x = y = z = 25^\circ$
- k. $x = 90^\circ, y = 50^\circ, z = 35^\circ$
- l. $x = 60^\circ, y = 120^\circ, z = 65^\circ$
- m. $x = 110^\circ, y = 55^\circ$
- n. $x = 30^\circ, y = 60^\circ$
- o. $x = 30^\circ, y = 70^\circ$
- p. $x = 80^\circ, y = 100^\circ, z = 200^\circ$
- q. $x = 65^\circ, y = 40^\circ$
- r. $x = 110^\circ, y = 55^\circ$

4. Proofs:

a. Given: $PQ = SR$

Prove: $PR = SQ$



$PQ = SR$ (given)

$\angle QPR = \angle QSR$ (inscribed angles subtended by same arc)

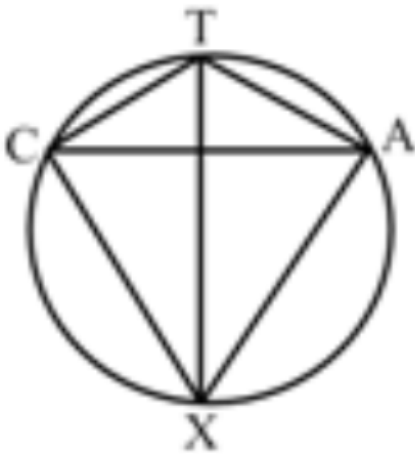
$\angle PRQ = \angle SQR$ (inscribed angles subtended by congruent arcs)

$\therefore \triangle PRQ \cong \triangle SQR$ (AAS)

$\therefore PR = SQ$ (def'n congruent triangles)

b. Given: Chord XT bisects $\angle CXA$ in the diagram shown.

Prove: $\triangle CAT$ is isosceles



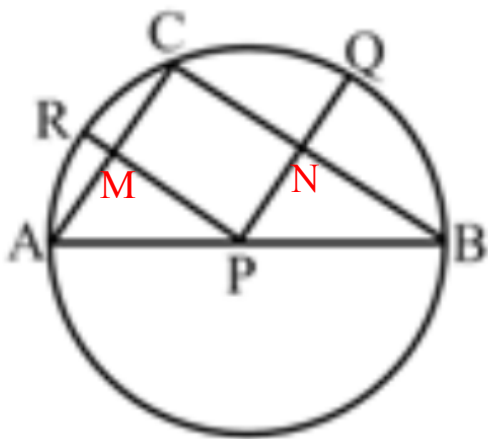
$$\angle CXT = \angle AXT \text{ (XT bisects } \angle CXA)$$

$\therefore CT = AT$ (congruent inscribed angles are subtended by congruent chords)

$\therefore \triangle CAT$ is isosceles (two sides are equal)

- c. Given: P is the centre of the circle shown.
PR bisects AC, PQ bisects BC.

Prove: PR is perpendicular to PQ



$\angle C = 90^\circ$ (inscribed angle subtended by a diameter)

$\angle PMC = 90^\circ$ (CPBT)

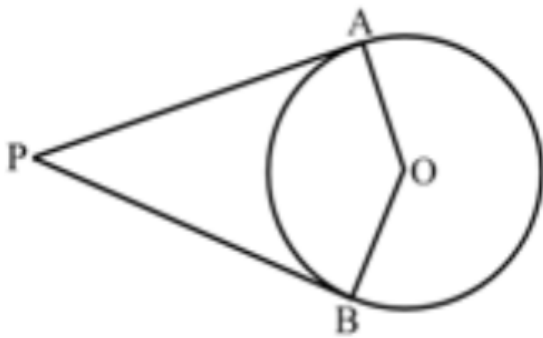
$\angle PNC = 90^\circ$ (CPBT)

$\therefore \angle RPQ = 90^\circ$ (sum of the angles in a quadrilateral)

$\therefore PR \perp PQ$ (def'n of perpendicular)

d. Given: Circle with centre O, PA & PB are tangents to the circle from a point P outside the circle

Prove: PAOB is a cyclic quadrilateral



$\angle A = 90^\circ$ (tangent property)

$\angle B = 90^\circ$ (tangent property)

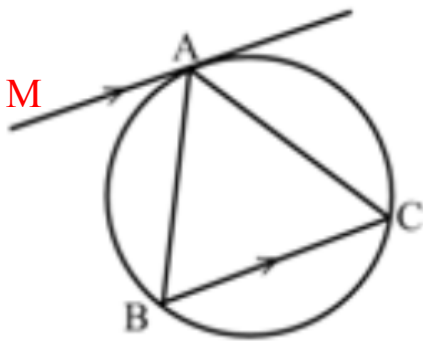
So $\angle A + \angle B = 180^\circ$

$\therefore \angle O + \angle P = 180^\circ$ (angle sum of a quadrilateral)

\therefore PAOB is a cyclic quadrilateral
(opposite angles are supplementary)

e. Given: The tangent at A is parallel to chord BC

Prove: $\triangle ABC$ is isosceles



$\angle MAB = \angle ABC$ (alternate interior angles)

$\angle MAB = \angle ACB$ (tangent property)

$\therefore \angle ABC = \angle ACB$ (both equal to $\angle MAB$)

$\therefore \triangle ABC$ is isosceles (two equal angles)