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. $x = 80^\circ$, $y = 100^\circ$, $z = 200^\circ$

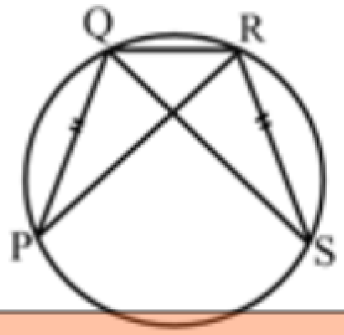
q. $x = 65^\circ$, $y = 40^\circ$

r. $x = 110^\circ$, $y = 55^\circ$

4. Proofs:

   a. Given: PQ = SR

      Prove: PR = SQ



PQ = SR (given)

<QPR = <QSR (inscribed angles subtended by same arc)

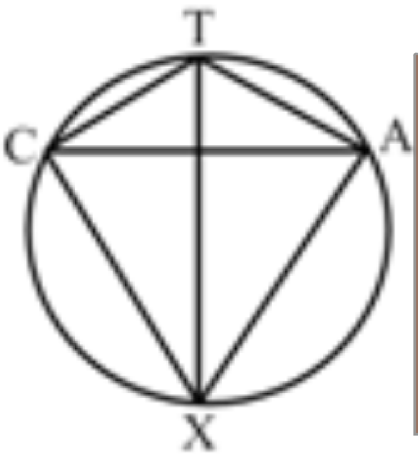
<PRQ = <SQR (inscribed angles subtended by congruent arcs)

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

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

b. Given: Chord XT bisects <CXA in the diagram shown.

Prove: ΔCAT is isosceles



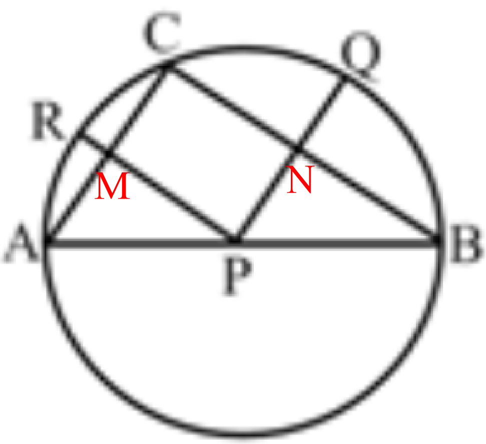
<CXT = <AXT (XT bisects <CXA)

∴ CT = AT (congruent inscribed angles are subtended by congruent chords)

∴ ΔCAT 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



<C = 90° (inscribed angle subtended by a diameter)

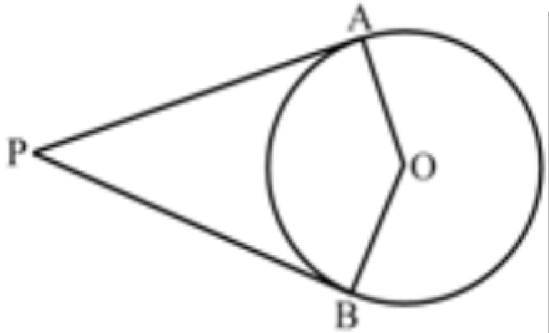
<PMC = 90° (CPBT)

<PNC = 90° (CPBT)

$\therefore$ <RPQ = 90° (sum of the angles in a quadrilateral)

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



<A = 90° (tangent property)

<B = 90° (tangent property)

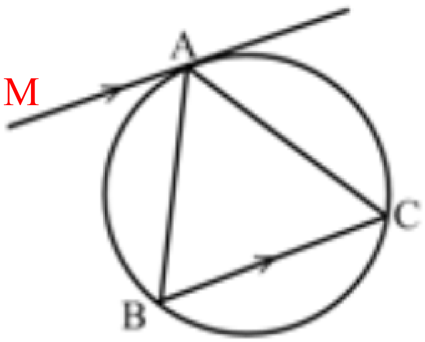
So <A + <B = 180°

∴ <O + <P = 180° (angle sum of a quadrilateral)

∴ PAOB is a cyclic quadrilateral (opposite angles are supplementary)

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

Prove: ΔABC is isosceles



<MAB = <ABC (alternate interior angles)

<MAB = <ACB (tangent property)

∴ <ABC = <ACB (both equal to <MAB)

∴ ΔABC is isosceles (two equal angles)