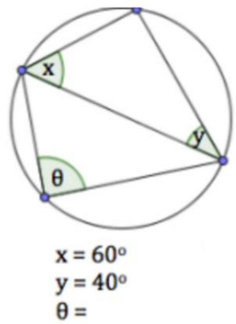
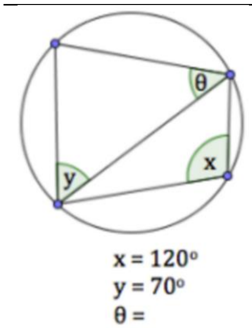
Circles - Solutions



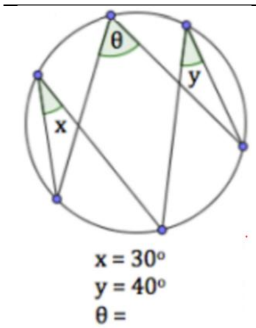
In the triangle with x and y, the third angle is
$180° - x - y$
$= 180° - 60° - 40°$
$= 80°$

Using one of the theorems,
$\theta + 80° = 180°$
$\theta = 100°$

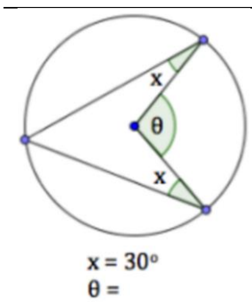


In the triangle with θ and y, the third angle = 180° - 120° = 60°

$180° = y + \theta + 60°$
$180° = 70° + \theta + 60°$
$\theta = 50°$



Since x and y together are in the same segment as θ,
$\theta = x + y$
$\theta = 30° + 40° = 70°$



Using one of the theorem, the left-most angle is ½ θ

$\frac{1}{2}\theta + 2x + (360° - \theta) = 360°$
$-\frac{1}{2}\theta + 2(30°) = 0$
$\theta = 2 \times 2(30°) = 120°$

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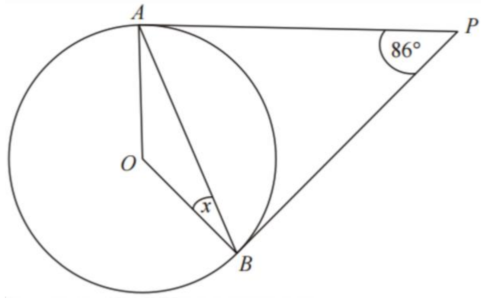
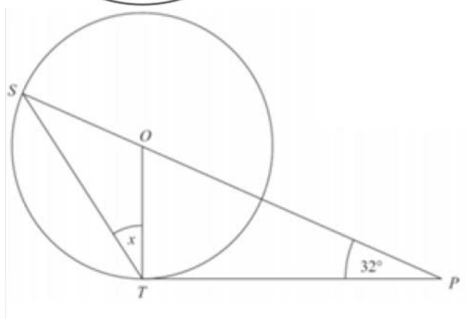


Using a theorem, ee know ∠OAP and ∠OBP are 90°.
In the quadrilateral OAPB,
90° + 90° + 86° +∠AOB = 360°
∠AOB = 94°
Since △OAB is isosceles,
2x + 94° = 180°
x = 43°



Since ∠OTP = 90°,
180° - 32° - 90° = ∠TOP
∠TOP = 58°

∠SOT + ∠TOP = 180°
∠SOT + 58° = 180°
∠SOT = 122°

Since △OST is isosceles,
2x + 122° = 180°
x = 29°