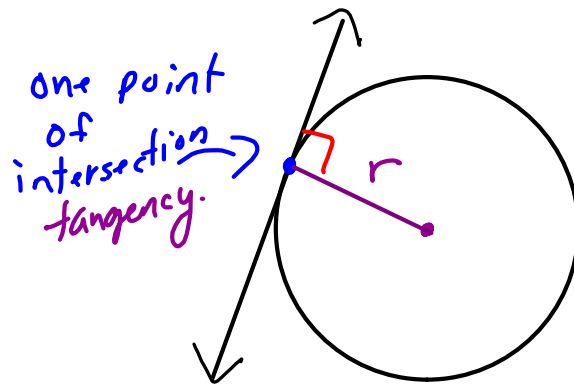


12.1 Tangent Lines

Tangent line: line, segment, or ray that intersects a circle at exactly one point.



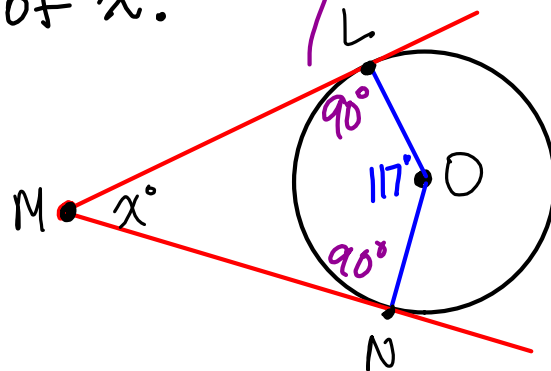
Property: a tangent and a radius that intersect, form a right angle.
(they are perpendicular.)

Ex 1 | \overline{ML} & \overline{MN} are tangent to $\odot O$.
Find the value of x .

$MLON$ is a Quad.

All \angle 's $\oplus 360^\circ$
 $- 90$
 $- 90$
 $- 117$

63°



Ex 2 What is the radius of $\odot C$?

radius = x

pyth. thm

$$x^2 + 12^2 = (x+8)^2$$

$$x^2 + 144 = (x+8)(x+8)$$

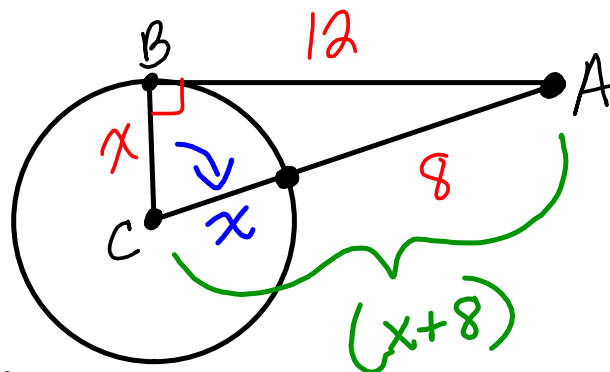
FOIL

$$\cancel{x^2} + 144 = \cancel{x^2} + 8x + 8x + 64$$

$$144 = 16x + 64$$

$$80 = 16x$$

$$\boxed{5 = x \text{ radius}}$$



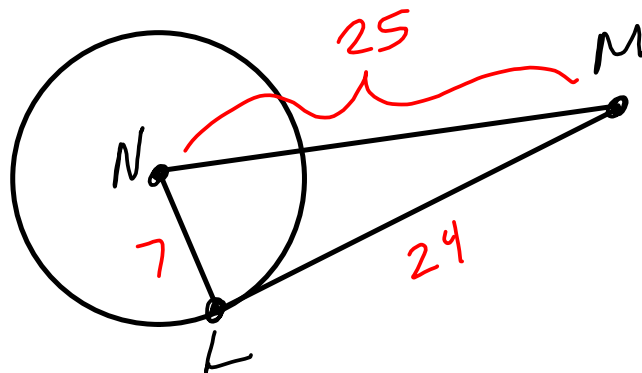
Ex 3 Is \overline{ML} tangent to $\odot N$ at L ?

pyth. thm
will confirm/deny
 $\angle L$ is 90°

$$7^2 + 24^2 = 25^2 ?$$

$$49 + 576 = 625$$

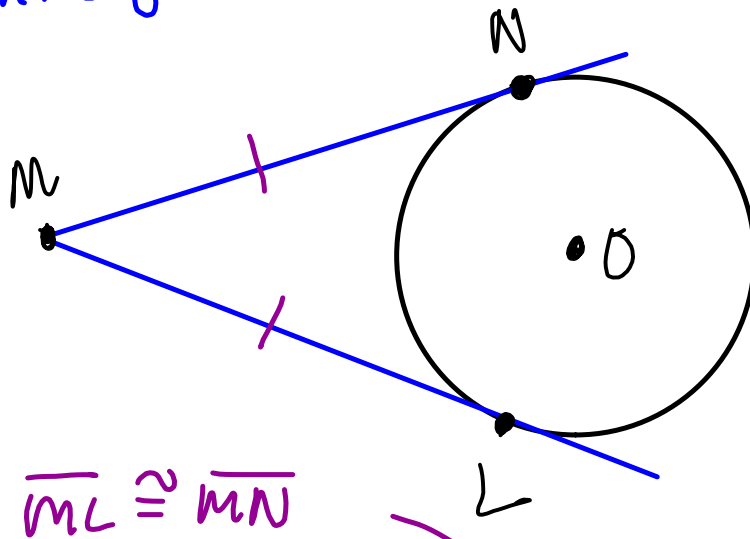
$$625 = 625 \checkmark$$



$\angle L = 90^\circ$ \overline{LM} is tangent

Property of tangents

If two tangents share a common endpoint, the line segments created are congruent.



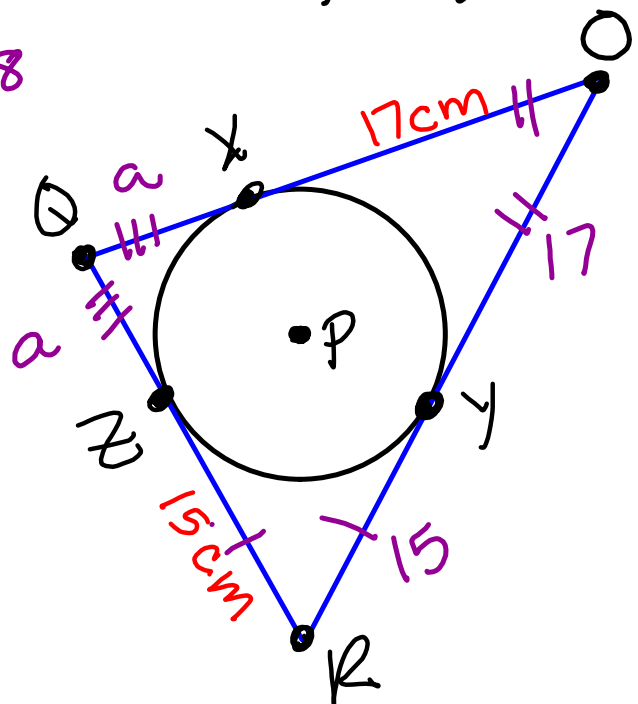
Ex 4) $\triangle QRO$ has a perimeter of 88cm. What is the length of \overline{QZ} ?

$$a + a + 17 + 17 + 15 + 15 = 88$$

$$2a + 64 = 88$$

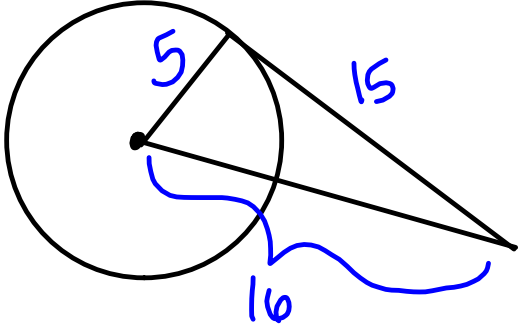
$$2a = 24$$

$$a = 12 = QZ$$

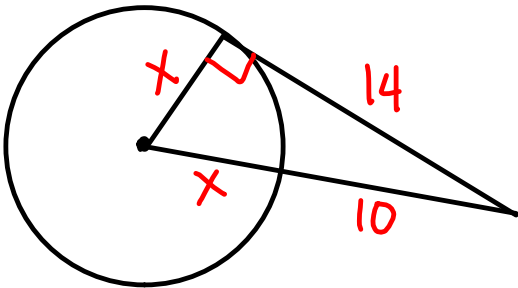


12.1 practice

① Determine whether a tangent is shown.



② What is the value of x ?



③ What is the perimeter of the polygon?

