

Geometry CC – Mr. Vaentino
Unit 12 Day 10: Tangent Secant Lengths

Name: _____
Date: _____ Per: _____

Aim: How can we find lengths of tangents and secants?

Do Now:

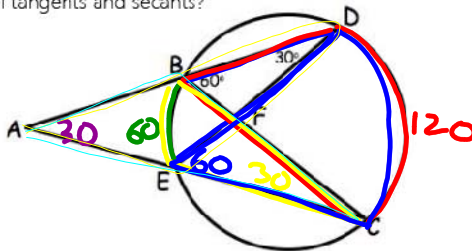
$m\angle DEC = 60$

$m\angle BCE = 30$

$m\widehat{DC} = 120$

$m\widehat{BE} = 60$

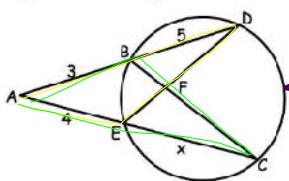
$m\angle A = 30$



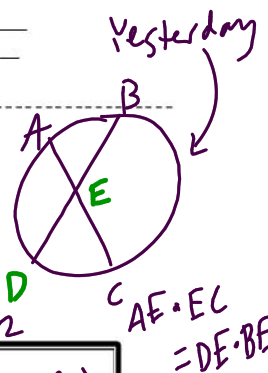
What can we say about $\triangle ADE$ and $\triangle ACB$?

They are similar.
AA \cong AA

Using the same diagram from the do now, how can we solve for x?



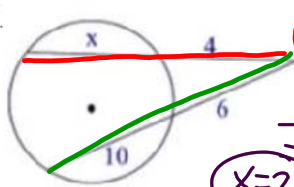
$\frac{8}{4} = \frac{4+x}{3}$
 $24 = 4(4+x)$
 $24 = 16 + 4x$
 $x = 2$



$AE \cdot EC = DE \cdot BE$

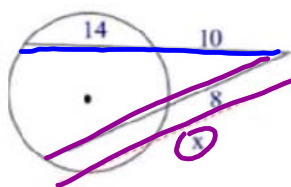
Secant-Secant Rule
(whole secant)(outside) = (whole secant)(outside)

1.



$(4+x)(4) = (10)(6)$
 $16 + 4x = 60$
 $-16 \quad -16$
 $4x = 44$
 $x = 11$

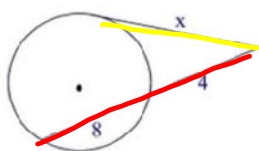
2.



$(x)(8) = (24)(6)$
 $8x = 240$
 $\frac{8x}{8} = \frac{240}{8}$
 $x = 30$

Tangent-Secant Rule
(tangent)² = (whole secant)(outside)

3.



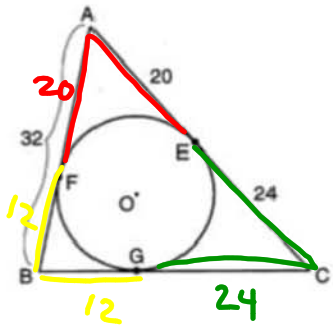
$x^2 = (12)(4)$
 $\sqrt{x^2} = \sqrt{48}$
 $x = \sqrt{48} = \sqrt{16 \cdot 3}$
 $x = 4\sqrt{3}$



Tangent-Tangent Rule aka the Party Hat Theorem:

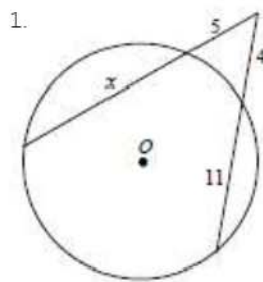
$$\text{tangent} = \text{tangent}$$

What is the length of BC?

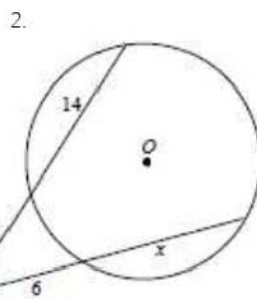


Practice Problems

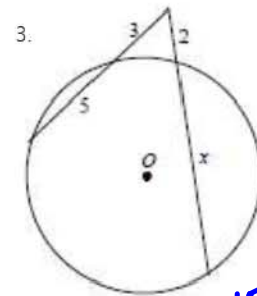
Find the value of x (to the nearest tenth if necessary):



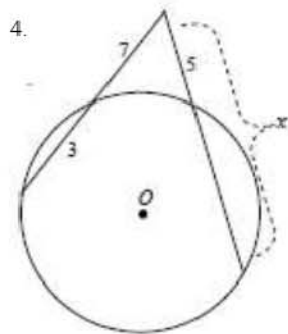
$$x = 7$$



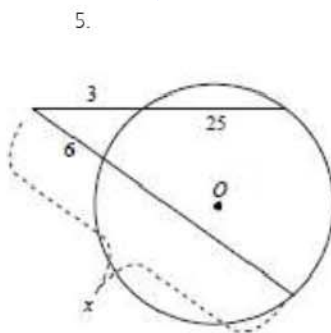
$$x = 6$$



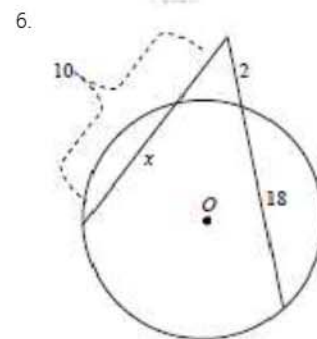
$$x = 10$$



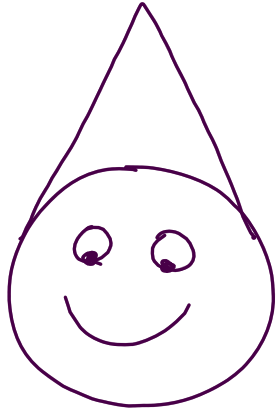
$$x = 14$$



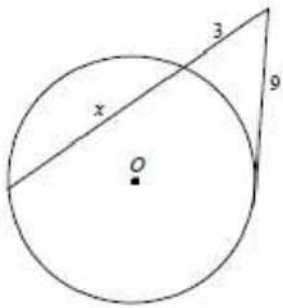
$$x = 14$$



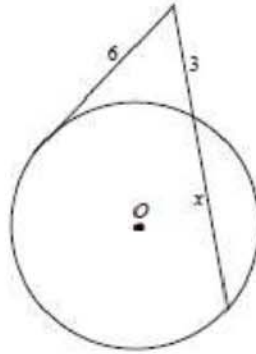
$$x = 6$$



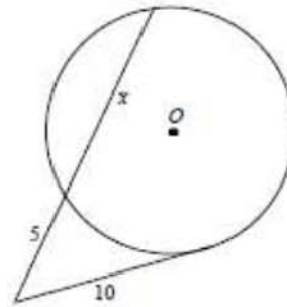
7.



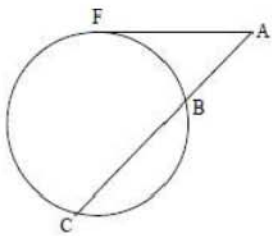
8.



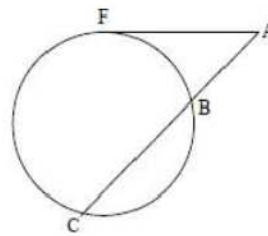
9.



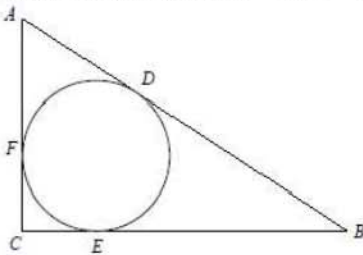
9. If $AC : AB = 4:1$ and $AF = 12$, find AB .



10. If $AB : BC = 1:3$ and $AF = 4$, find AB .



11. In the diagram below, $AF = 5$, $CE = 3$, $DB = 12$. Determine if $\triangle ABC$ is a right triangle.



12. If $PQ = 4x - 1$, $SQ = x + 11$, $OP = 2x$, find each of the following:

a) x b) PQ

c) OP d) OQ

