

use FOIL when multiplying binomials

F first · first
 O outside · outside
 I inside · inside
 L last · last

Geometry DAY 8.2
 Line Segments (Tangents)

Name: Key Date: _____

WARM-UP:
 Simplify by expanding.

1. $(x+2)(x-4)$
 $x^2 - 4x + 2x - 8$
 $x^2 - 2x - 8$

2. $(x-6)^2 = (x-6)(x-6)$
 $x^2 - 6x - 6x + 36$
 $x^2 - 12x + 36$

Find solutions by solving (factoring is possible).

3. $x^2 - 48 = 0$
 $\sqrt{x^2} = \sqrt{48}$
 $x = \sqrt{48}$
 $x = \sqrt{16 \cdot 3} = 4\sqrt{3}$

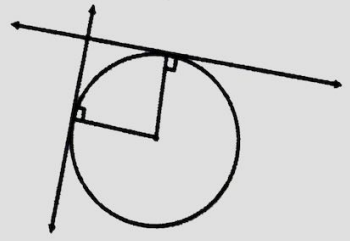
4. $x^2 + 7x + 10 = 0$
 $(x+5)(x+2) = 0$
 $x+5=0$ $x+2=0$
 $x=-5$ $x=-2$

5. $x^2 + 10x - 24 = 0$
 $(x-2)(x+12) = 0$
 $x-2=0$ $x+12=0$
 $x=2$ $x=-12$

Tangent: a line in the plane of a circle that intersects the circle in exactly one point.

Theorems Involving Tangents

If a line is tangent to a circle, then it is perpendicular to the radius drawn to the point of tangency.

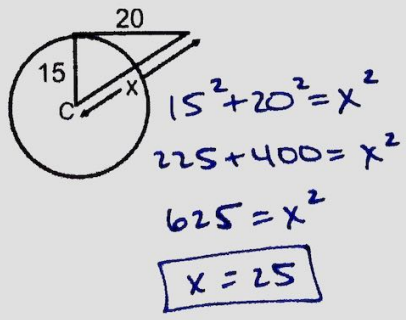


In a plane, if a line is perpendicular to a radius of a circle at its endpoint on the circle, then the line is a tangent of the circle.

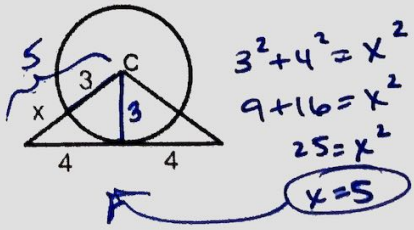
Examples

Find the value of x. Assume that C is the center of the circle and that segments that appear to be tangent are tangent.

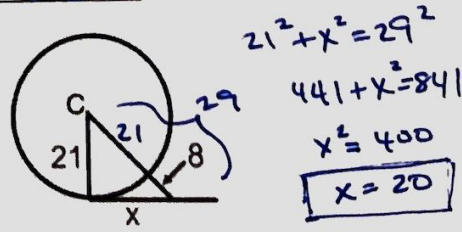
1. $x = 25$



2. $x = 2$



3. $x = 20$



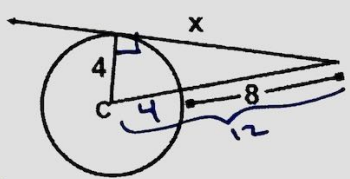
4. $x = 8\sqrt{2}$

$4^2 + x^2 = 12^2$

$16 + x^2 = 144$

$x^2 = 128$

$x = \sqrt{64} \cdot \sqrt{2} = 8\sqrt{2}$



5. $x = 5$

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

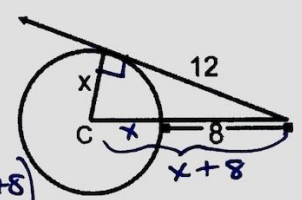
$x^2 + 144 = (x+8)(x+8)$

$x^2 + 144 = x^2 + 8x + 8x + 64$

$x^2 + 144 = x^2 + 16x + 64$

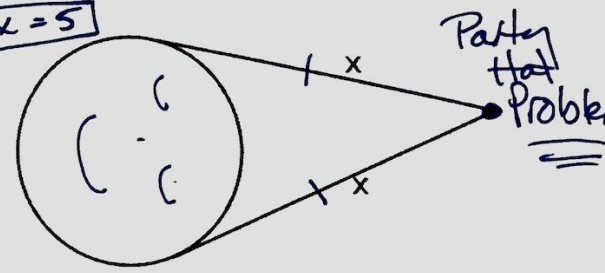
$80 = 16x$

$x = 5$



Another Theorem involving Tangents

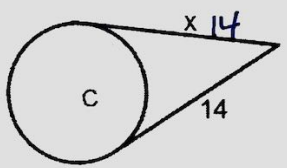
If two segments from the same exterior point are tangent to a circle, then they are congruent.



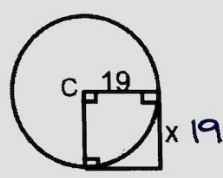
Examples

Find the value of x. Assume that C is the center of the circle and that segments that appear to be tangent are tangent.

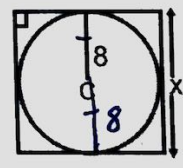
1. $x = 14$



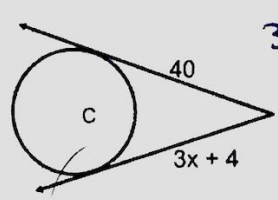
2. $x = 19$



3. $x = 16$



4. $x = 12$

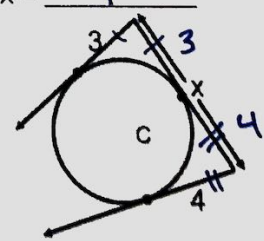


$3x + 4 = 40$

$3x = 36$

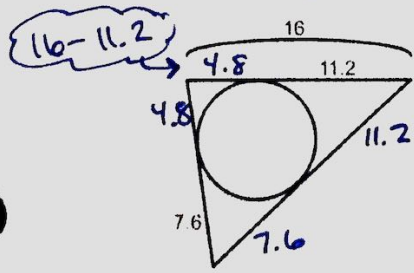
$x = 12$

5. $x = 7$



$3 + 4 = 7$

6. perimeter = 47.2



$11.2 + 11.2 + 4.8 + 4.8 + 7.6 + 7.6 = 47.2$

7. $x = 16$

