

## CODE YELLOW

1. A circle has its center at  $(\overset{h}{-4}, \overset{k}{3})$  and a radius of 7 units.

Write the equation for the circle:

$$(x-h)^2 + (y-k)^2 = r^2$$

$$(x+4)^2 + (y-3)^2 = 49$$

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2. Determine the radius and the center of the circle with the equation:  $(x+5)^2 + (y+2)^2 = 13$

$$r = \sqrt{13} = 3.4 \quad c = (\overset{h}{-5}, \overset{k}{-2})$$

$$(x-h)^2 + (y-k)^2 = r^2$$

$$\begin{aligned} r &= \sqrt{13} \\ r &= 3.4 \end{aligned}$$

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3. What is the equation of a circle with a circumference of  $8\pi$  and centered at the origin?

$$(x-h)^2 + (y-k)^2 = r^2$$

$$x^2 + y^2 = 16$$

$$r = 4$$

$$C = (0, 0)$$

$$C = 2\pi r$$

$$\frac{8\pi}{2\pi} = \frac{2\pi r}{2\pi}$$

$$4 = r$$

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4. The equation  $(x-1)^2 + (y+4)^2 = r^2$  represents Circle *W*. The point  $V(-5, 4)$  lies on the circle. What is  $r$ , the radius of the circle?

$$(x-1)^2 + (y+4)^2 = r^2$$

$$(-5-1)^2 + (4+4)^2 = r^2$$

$$(-6)^2 + (8)^2 = r^2$$

$$\sqrt{100} = \sqrt{r^2} \longrightarrow r = 10$$

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5. The endpoints of the diameter of a circle are  $(5, -12)$  and  $(-3, -6)$ . What is the equation of the circle?

$$M = \left( \frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

$$= \left( \frac{5 + (-3)}{2}, \frac{-12 + (-6)}{2} \right)$$

$$= \left( \frac{2}{2}, \frac{-18}{2} \right)$$

$$= \left( 1, -9 \right)$$

h                  k

$$(x-h)^2 + (y-k)^2 = r^2$$

$$(x-1)^2 + (y+9)^2 = 25$$

$$(5-1)^2 + (-12+9)^2 = r^2$$

$$(4)^2 + (-3)^2 = r^2$$

$$(25) = r^2$$

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6. Circle J has a center at  $(-2, 4)$  and a diameter of 12 units. Which point lies on Circle J? radius = 6

~~a) (3,1)~~

$$(x+2)^2 + (y-4)^2 = 36$$

$$(3+2)^2 + (1-4)^2 = 36$$

$$34 \neq 36$$

b) (4,4)

$$36 = 36$$

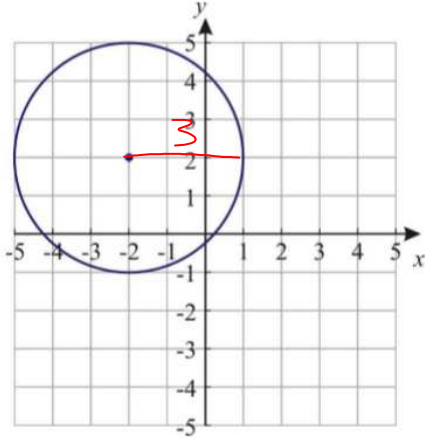
~~c) (-6,0)~~

$$(-6+2)^2 + (0-4)^2 = 36$$

$$32 \neq 36$$

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7. Write the equation for the circle shown below.



$$r = 3$$

$$C = (-2, 2)$$

$$(x+2)^2 + (y-2)^2 = 9$$

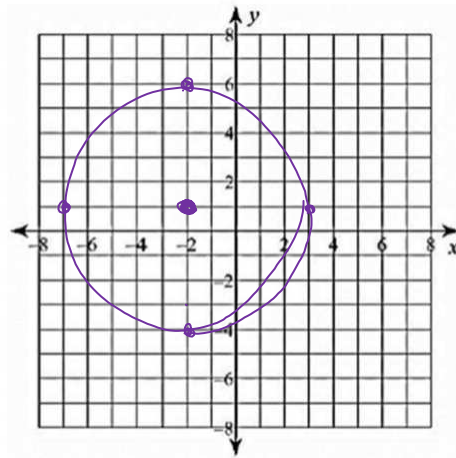
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8. Given:  $(x+2)^2 + (y-1)^2 = 25$

Plot the center and another point on the circle.

$$r = 5$$

$$C = (-2, 1)$$



# Segment Lengths in Circles

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**SOL G.11**

BY THE END OF CLASS TODAY, I WILL BE ABLE TO SOLVE PROBLEMS INVOLVING SEGMENT LENGTHS IN CIRCLES, BY COMPLETING GUIDED NOTES AND A CLASS PROBLEM SET, BEFORE SCORING AT LEAST 75% ON THE CLASS EXIT TICKET.

**ESSENTIAL QUESTIONS:**

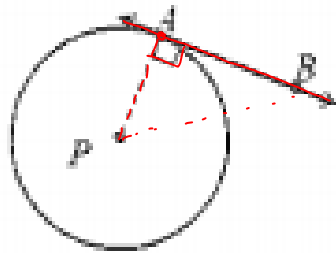
- HOW CAN LINE SEGMENTS FORM ANGLES BOTH INSIDE AND OUTSIDE OF CIRCLES?
- HOW CAN INTERCEPTED ARCS BE USED TO SHOW A RELATIONSHIP AMONG ANGLES, LINE SEGMENTS AND LINES?

## Today's Agenda

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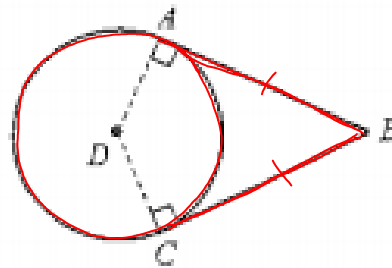
- ✓ Equations of Circles Quiz Review
- ✓ Tangents of Circles
- ✓ Segments in Circles
- ✓ Kahoot!
- ✓ Exit Ticket

## CODE YELLOW

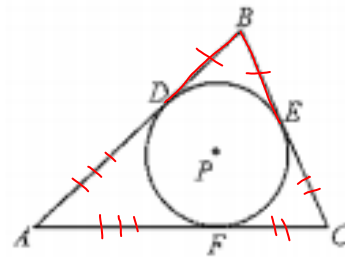
Tangents

To prove a line is tangent, use the **Pythagorean Theorem**:

$$c^2 = a^2 + b^2$$

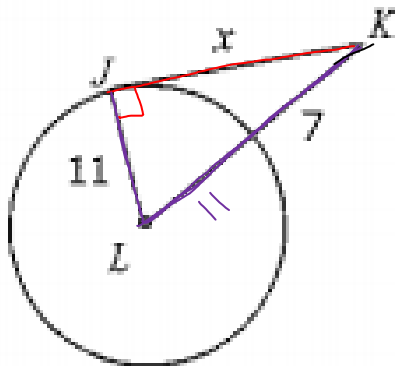


$$\overline{AB} \cong \overline{CB}$$



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1. Find x.



$$c^2 = a^2 + b^2$$

$$18^2 = x^2 + 11^2$$

$$324 = x^2 + 121$$

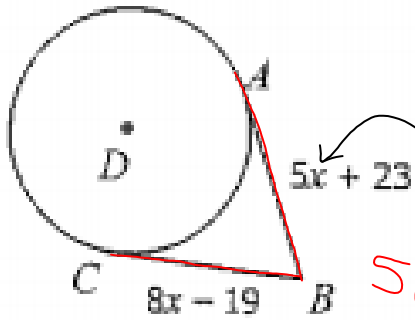
$$\begin{array}{r} 324 = x^2 + 121 \\ -121 \phantom{=} \\ \hline \end{array}$$

$$\sqrt{203} = \sqrt{x^2}$$

$$\boxed{14.2 = x}$$

## CODE YELLOW

2. Find  $\overline{AB}$ .



$$8x - 19 = 5x + 23$$

$$\begin{array}{r} -5x \\ \hline 3x - 19 = 23 \end{array}$$

$$3x - 19 = 23$$

$$\begin{array}{r} +19 \quad +19 \\ \hline 3x = 42 \end{array}$$

$$\begin{array}{r} \frac{3x}{3} = \frac{42}{3} \\ \hline x = 14 \end{array}$$

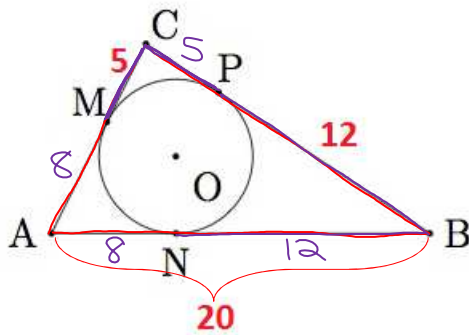
$$5(14) + 23$$

$$\begin{array}{r} 70 \\ + 23 \\ \hline 93 \end{array}$$

$$x = 14$$

## CODE YELLOW

3. Find the perimeter.

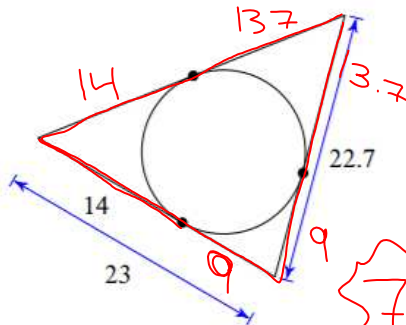


$$\begin{array}{r} 3 \\ 12 \\ 12 \\ 12 \\ 8 \\ + 8 \\ \hline 50 \end{array}$$

## CODE RED – DO NOW

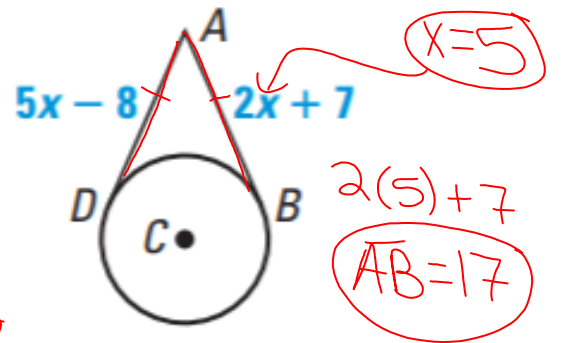
Complete Problems #1-2

1. Find the perimeter of the triangle below:



73.4

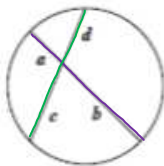
2. Find  $\overline{AB}$ .



## CODE YELLOW

### SEGMENT LENGTHS: INTERSECTING CHORDS, SECANTS, & TANGENTS

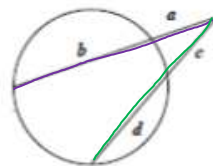
Intersecting chords  
(or secants) on the  
interior of a circle.



$$PP = PP$$

$$a \times b = c \times d$$

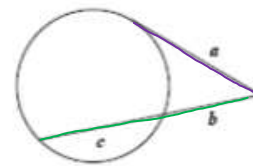
Two secants  
intersecting on the  
exterior of a circle.



$$OW = OW$$

$$a(a+b) = c(c+d)$$

A secant and a  
tangent intersecting on  
the exterior of a circle.



$$OW = OW$$

$$a^2 = b(b+c)$$



## CODE YELLOW

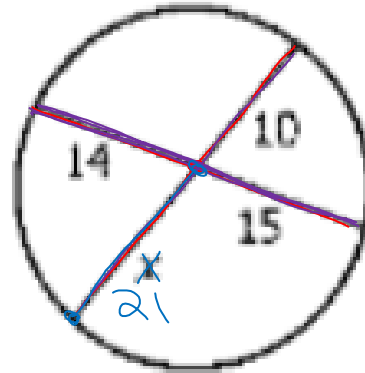
1. Solve for x.

$$PP = PP$$

$$14 \times 15 = 10x$$

$$\frac{210}{10} = \frac{10x}{10}$$

$$\boxed{21 = x}$$



## CODE YELLOW

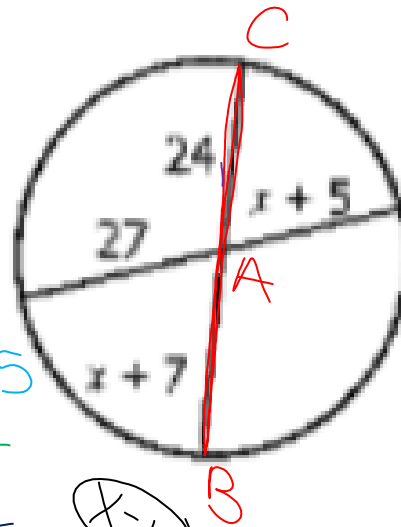
3. Solve for x.

$$PP = PP$$

$$24(x+7) = 27(x+5)$$

$$24x + 168 = 27x + 135$$

$$\begin{array}{r} 24x + 168 = 27x + 135 \\ -24x \quad -24x \\ \hline 168 = 3x + 135 \\ -135 \quad -135 \\ \hline 33 = 3x \\ \frac{33}{3} = \frac{3x}{3} \end{array}$$



$$\boxed{x=11}$$

## CODE GREEN

2. Find  $BD$ .

$$BD = 4 + 5x - 1$$

$$4 + 5(2) - 1 = 13$$

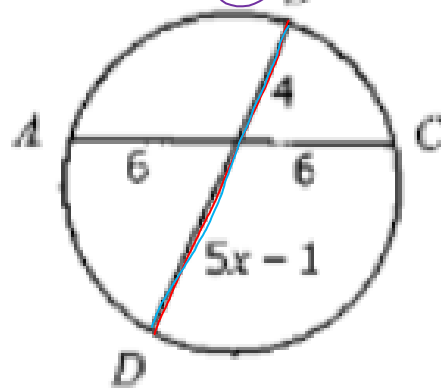
$$PP = PP$$

$$6 \times 6 = 4(5x - 1)$$

$$\begin{array}{r} 36 = 20x - 4 \\ +4 \quad \quad +4 \end{array}$$

$$\begin{array}{r} 40 = 20x \\ \underline{20} \quad \underline{20} \end{array}$$

$$2 = x$$



## CODE YELLOW

5. Solve for  $x$ .

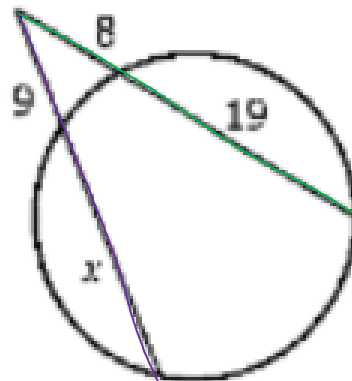
$$OW = OW$$

$$9(9+x) = 8(27)$$

$$\begin{array}{r} 81 + 9x = 216 \\ -81 \quad \quad -81 \end{array}$$

$$\begin{array}{r} 9x = 135 \\ \underline{9} \quad \quad \underline{9} \end{array}$$

$$x = 15$$



## CODE YELLOW

7. Solve for x.

$OW = OW$

$$8(8 + 3x + 4) = 7(7 + 5x + 2)$$

$$64 + 24x + 32 = 49 + 35x + 14$$

$$24x + 96 = 35x + 63$$

$$\begin{array}{r} 24x + 96 = 35x + 63 \\ -24x \quad -24x \\ \hline 96 = 11x + 63 \\ -63 \quad -63 \\ \hline 33 = 11x \\ \underline{\quad} \quad \underline{\quad} \\ 3 = x \end{array}$$

$x = 3$

## CODE GREEN

6. Find NL.

$OW = OW$

$$10(52) = 13(13 + x)$$

$$520 = 169 + 13x$$

$$\begin{array}{r} 520 = 169 + 13x \\ -169 \quad -169 \\ \hline 351 = 13x \\ \underline{\quad} \quad \underline{\quad} \\ 27 = x \end{array}$$

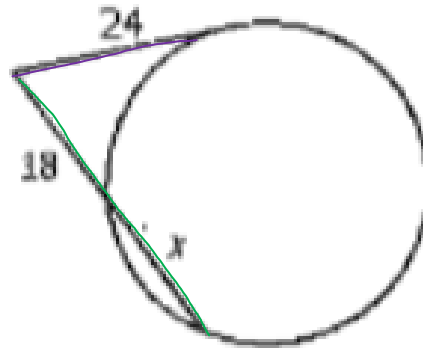
$27 = x$

$$\begin{array}{r} 27 \\ +13 \\ \hline 40 \end{array}$$


## CODE YELLOW

9. Solve for x.

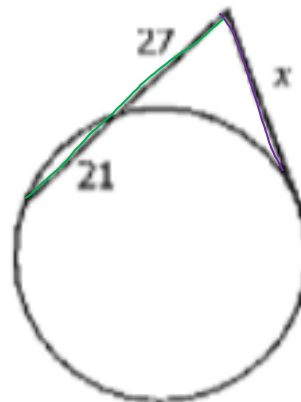
$$\begin{aligned}
 OW &= OW \\
 24^2 &= 18(18+x) \\
 576 &= 324 + 18x \\
 \underline{-324} \quad \underline{-324} & \\
 252 &= 18x \\
 \frac{252}{18} &= \frac{18x}{18} \\
 14 &= x
 \end{aligned}$$



## CODE YELLOW

11. Solve for x.

$$\begin{aligned}
 OW &= OW \\
 x^2 &= 27(48) \\
 \sqrt{x^2} &= \sqrt{1296} \\
 x &= 36
 \end{aligned}$$



## CODE GREEN

10. Find  $PN$ .

$$PN = 5(5) - 1 = \textcircled{24}$$

$$OW = OW$$

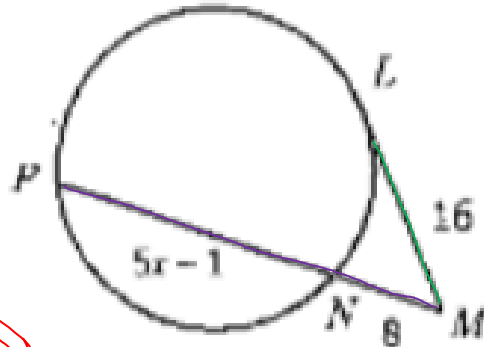
$$16^2 = 8(8 + 5x - 1)$$

$$256 = 64 + 40x - 8$$

$$256 = 40x + 56$$

$$\begin{array}{r} 256 = 40x + 56 \\ -56 \quad -56 \\ \hline 200 = 40x \\ \underline{40} \quad \underline{40} \end{array}$$

$$\textcircled{x=5}$$



## CODE BLUE

# KAHOOT!!

<https://play.kahoot.it/#/k/87ef0b65-aa77-44e2-92f2-c3e64ede6c5a>

**CODE RED – EXIT TICKET**

**Write a paragraph (3-5 sentences) summarizing what you learned in this lesson.**

Complete your EXIT TICKET silently and independently at your seat. Remember to do your best and TRY every problem.

When you are finished, raise your hand and Coach Riddick will come around to collect it.