Day 5: Tangent Lines & Pythagorean Theorem

Date_____

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1) There is a great property of lines that are tangent to a circle. It is that a tangent line is

Perpendicular to the center of the circle.
radius, chord.

Because it is perpendicular, we can make a right. triangle.

Right triangles have great properties. One very known theorem we use with right triangles is the Pythagorean Theorem.

What is the Pythagorean Theorem? $a^2+b^2=c^2$

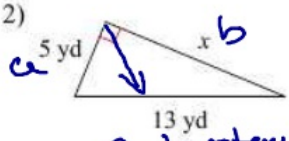
Why is it used?

If we know the circle is tangent, then we can find missing sides.
If we know all the sides, then we can prove the line is tangent.

First, let's review using the pythagorean theorem.

Find the missing side of each triangle. Round your answers to the nearest tenth if necessary.

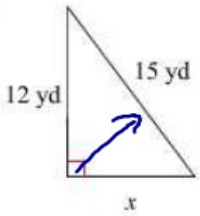
2)



a b
c hypotenuse

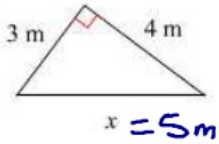
$5^2+x^2=13^2$
$25+x^2=169$
$-25 \quad -25$
$\sqrt{x^2}=\sqrt{144}$
$x=12$ yds

3)



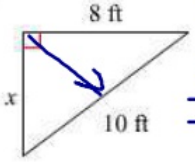
$12^2+x^2=15^2$
$144+x^2=225$
$-144 \quad -144$
$x^2=81$
$x=9$ yds.

4)



$x=5$m

5)



$8^2+x^2=10^2$
$64+x^2=100$
$-64 \quad -64$
$x^2=36$
$x=6$ ft

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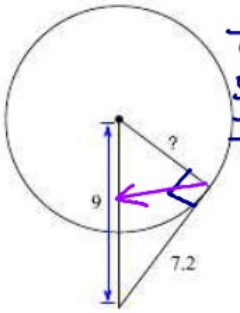
Find the segment length indicated. Assume that lines which appear to be tangent are tangent.

6)



$7.2^2 + b^2 = 9^2$

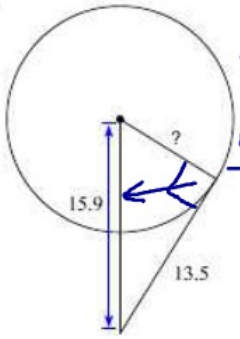
$51.84 + b^2 = 81$

$-51.84 \quad -51.84$

$\sqrt{b^2} = \sqrt{29.16}$

$b = 5.4$

7)



$13.5^2 + x^2 = 15.9^2$

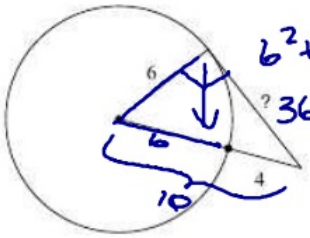
$182.25 + x^2 = 252.81$

$-182.25 \quad -182.25$

$\sqrt{x^2} = \sqrt{70.56}$

$x = 8.4$

8)



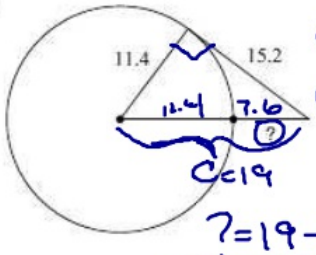
$6^2 + x^2 = 10^2$

$36 + x^2 = 100$

$x^2 = 64$

$x = 8$

9)



$11.4^2 + 15.2^2 = c^2$

$129.96 + 231.04 = c^2$

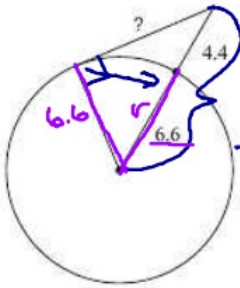
$\sqrt{361.0} = \sqrt{c^2}$

$19 = c$

$? = 19 - 11.4$

$? = 7.6$

10)



$6.6^2 + x^2 = 11^2$

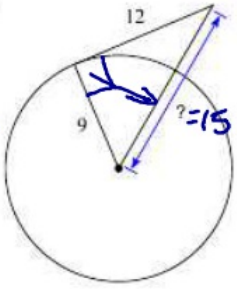
$43.56 + x^2 = 121$

$-43.56 \quad -43.56$

$\sqrt{x^2} = \sqrt{77.44}$

$x = 8.8$

11)



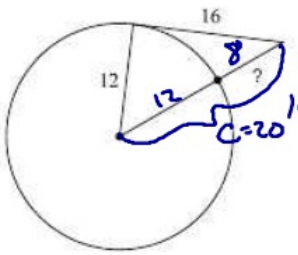
$9^2 + 12^2 = c^2$

$81 + 144 = c^2$

$225 = c^2$

$15 = c$

12)



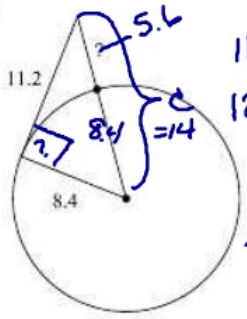
$12^2 + 16^2 = c^2$

$144 + 256 = c^2$

$400 = c^2$

$20 = c$

13)



$11.2^2 + 8.4^2 = c^2$

$125.44 + 70.56 = c^2$

$196 = c^2$

$14 = c$

$? = 14 - 8.4$

$= 5.6$

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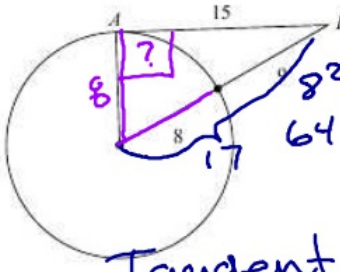
Determine if line AB is tangent to the circle.

14)



$8^2+15^2 \stackrel{?}{=} 17^2$

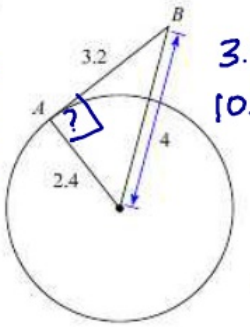
$64+225 \stackrel{?}{=} 289$

$289 = 289$

yes!

Tangent.

15)



$3.2^2 + 2.4^2 = 4^2$

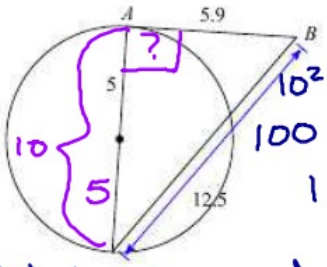
$10.24 + 5.76 = 16$

$16 = 16$

yes

Tangent.

16)



$10^2 + 5.9^2 \stackrel{?}{=} 12.5^2$

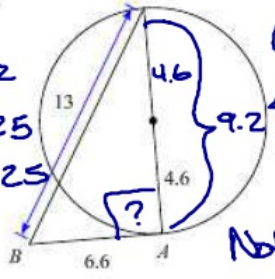
$100 + 34.8 \stackrel{?}{=} 156.25$

$134.8 \neq 156.25$

NO

Not Tangent.

17)



$6.6^2 + 9.2^2 \stackrel{?}{=} 13^2$

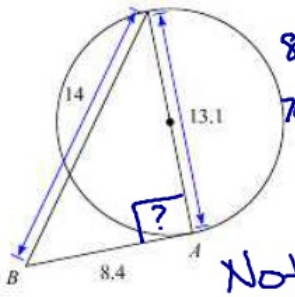
$43.56 + 84.64 = 169$

$128.2 \neq 169$

NO

Not Tangent.

18)



$8.4^2 + 13.1^2 \stackrel{?}{=} 14^2$

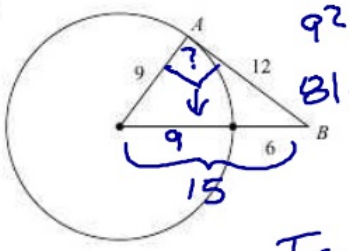
$70.56 + 171.61$

$242.17 \neq 196$

NO

Not Tangent.

19)



$9^2 + 12^2 \stackrel{?}{=} 15^2$

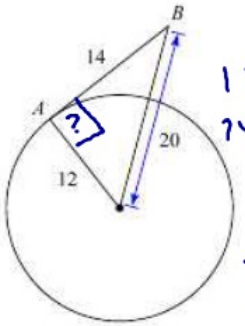
$81 + 144 = 225$

$225 = 225$

yes!

Tangent.

20)



$12^2 + 14^2 \stackrel{?}{=} 20^2$

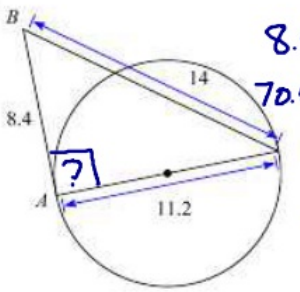
$144 + 196 \stackrel{?}{=} 400$

$340 \neq 400$

No

Not Tangent.

21)



$8.4^2 + 11.2^2 \stackrel{?}{=} 14^2$

$70.56 + 125.44 = 196$

$196 = 196$

yes.

Tangent

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