Team Problems for Chapter 12
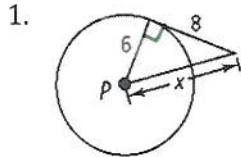
Name: _Solutions_

Date: _____

Problem #1: Chords/Tangents/Radii Problems

Find the value of x in each figure below. Assume lines that appear to be tangents are tangents.
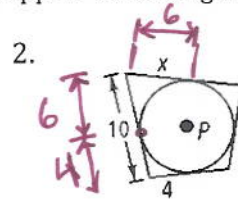
1.

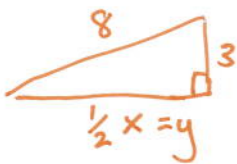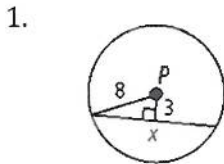

2.

$x = 6$

$6^2 + 8^2 = x^2$

$36 + 64 = x^2$

$100 = x^2$

$10 = x$

Problem #2: More Chords/Tangents/Radii Problems

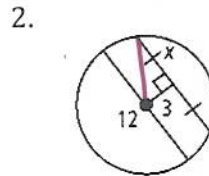Find the value of x in each figure below. Assume lines that appear to be tangents are tangents.

1.

2.

radius = 6

$\frac{1}{2}x = y$

$y^2 + 3^2 = 8^2$

$y^2 + 9 = 64$

$y^2 = 56$

$y = \sqrt{56} = 2\sqrt{14}$

$x = 2y = 4\sqrt{14}$

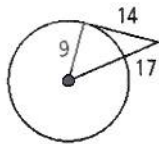$3^2 + x^2 = 6^2$

$x^2 = 36 - 9$

$x^2 = 27$

$x = \sqrt{27} = 3\sqrt{3}$

Problem #3: Tangent Line or not?

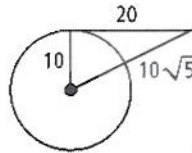Determine whether a tangent line is shown in each diagram.

1.

No!

$$9^2 + 14^2 \overset{?}{=} 17^2$$

$$81 + 196 \overset{?}{=} 289$$

$$277 \neq 289$$
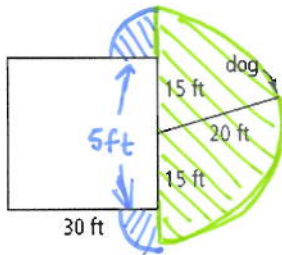
2.

Yes!

$$10^2 + 20^2 \overset{?}{=} (10\sqrt{5})^2$$

$$100 + 400 \overset{?}{=} 100 \cdot 5$$

$$500 \overset{\checkmark}{=} 500$$

Problem #4: An Area Problem

A dog is on a 20-ft leash. The leash is attached to a pipe at the midpoint of the back wall of a 30 ft-by-30 ft house, as shown in the diagram. Sketch and use shading to indicate the region in which the dog can play while attached to the leash. Find the area of this region.
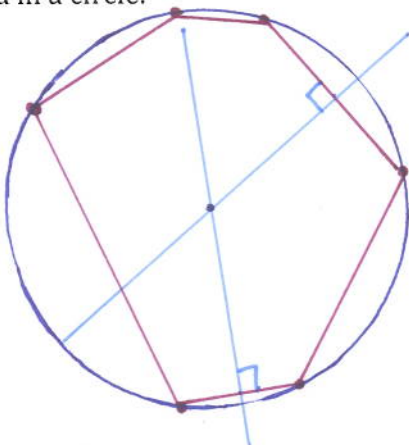

$$\text{Total area} = \tfrac{1}{2}\pi(20)^2 + \tfrac{1}{2}\pi(5)^2$$

$$= \tfrac{1}{2}\pi(400) + \tfrac{1}{2}\pi(25)$$

$$= 212.5 \cdot \pi = \boxed{667.3 \text{ ft}^2}$$

Problem #5: Inscribed Polygons

A polygon is inscribed in a circle. Are the perpendicular bisectors of the sides of the polygon concurrent? Explain. Illustrate your explanation with a picture of a (not regular!) hexagon inscribed in a circle.

Yes! The sides of the polygon are chords of the circle, so their perpendicular bisectors are concurrent at the center of the circle.

Two are drawn here.