Geometry H

Review for Quiz on Properties of Circles (10.1, 10.2 and 10.4)

Name: **Answer Key**

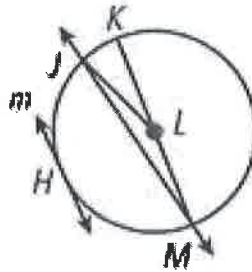Date: _____ Period: _____

1) Identify each line or segment that intersects $\odot L$.

chords: $\overline{JM}, \overline{KM}$

secant: $\overleftrightarrow{JM}$

tangent: line m

diameter: $\overline{KM}$

radii: $\overline{LK}, \overline{LM}, \overline{LJ}$

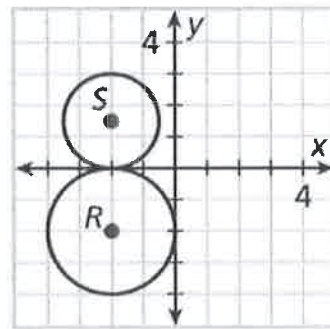Use the diagram to the right to complete questions 2 - 5

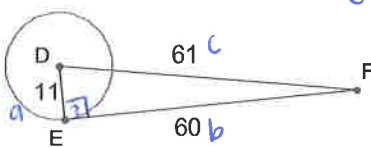2) Radius of $\odot S$ = 1.5 units

3) Diameter of $\odot S$ = 3 units

4) Radius of $\odot R$ = 2 units

5) Diameter of $\odot R$ = 4 units
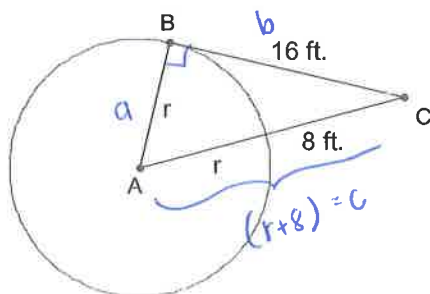

6) Is $\overline{EF}$ tangent to $\odot D$?

$$c^2 \underline{\quad} a^2 + b^2$$

$$61^2 \underline{\quad} 11^2 + 60^2$$

$$3721 = 3721$$

Yes, $\overline{EF}$ is tangent to $\odot D$ since $a^2 + b^2 = c^2$, so there is a right angle where $\overline{DE}$ and $\overline{EF}$ meet.

7) Find the radius of $\odot A$

$$r^2 + 16^2 = (r+8)^2$$
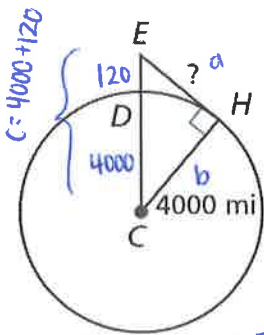
$$r^2 + 256 = (r+8)(r+8)$$

$$r^2 + 256 = r^2 + 16r + 64$$

$$256 = 16r + 64$$

$$192 = 16r$$

$$\boxed{r = 12 \text{ ft}}$$

8) Early in its flight, the Apollo 11 spacecraft orbited Earth 120 miles above the Earth's atmosphere(*ED*). What was the distance from the spacecraft to Earth's horizon rounded to the nearest mile? Let *C* be the center of Earth, *E* be the spacecraft, and *H* be a point on the horizon.

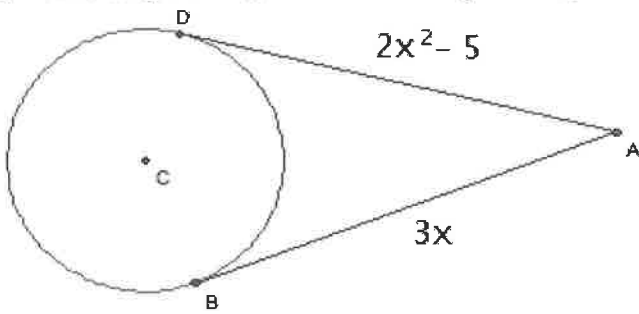$$x^2 + 4000^2 = 4120^2$$

$$x^2 + 16000000 = 16974400$$

$$x^2 = 974400$$

$$\boxed{x = 987 \text{ miles}}$$

$\overline{ED}$ is the distance above Earth

$\overline{CD}$ is a radius so it is $\cong$ to $\overline{CH}$

9) AB is tangent to $\odot C$ at B. AD is tangent to $\odot C$ at D. Find the value(s) of x.
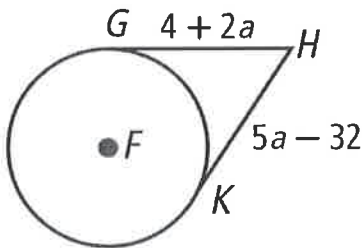
$2x^2 - 5$

$3x$

$$2x^2 - 5 = 3x$$

$$2x^2 - 3x - 5 = 0$$

$$2x^2 + 2x - 5x - 5 = 0$$

$$2x(x+1) - 5(x+1) = 0$$

$$(2x-5)(x+1) = 0$$

$$\boxed{x = 2.5 \text{ or } \cancel{x = -1}} \leftarrow \text{not a solution b/c } AB \neq -3$$

10) HK and HG are tangent to $\odot F$. Find HG.

$G \quad 4 + 2a$

$5a - 32$

$$4 + 2a = 5a - 32$$

$$36 = 3a$$

$$a = 12$$

$$HG = 4 + 2(12)$$

$$\boxed{HG = 28}$$

For questions 11- 14, use the following diagram.

11) $m\overset{\frown}{AB} = 120°$ (b/c 120° is a central angle)

12) $m\overset{\frown}{BC} = 60°$ (180-120 = 60)

13) $m\overset{\frown}{CAB} = 180 + 120 = 300°$

14) $m\overset{\frown}{CBA} = 180°$ ($\overline{AC}$ cuts the circle into 2 halves)

180°

A   120' 60°   C

120°   60°

B
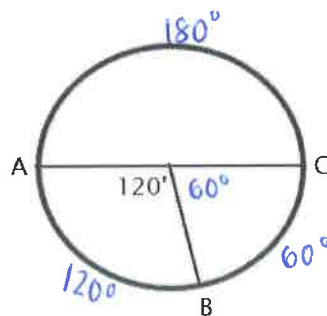
15) Find the measure of $\overset{\frown}{AB}$ and $\overset{\frown}{DC}$.
Are they congruent?

① $m\overset{\frown}{AB} = 45°$, $m\overset{\frown}{DC} = 45°$
② same circle
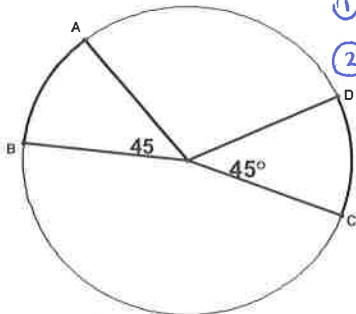
Since $m\overset{\frown}{AB} = m\overset{\frown}{DC}$ and the arcs are in the same circle, $\overset{\frown}{AB} \cong \overset{\frown}{DC}$.

16) Find the measure of $\overset{\frown}{XY}$ and $\overset{\frown}{WZ}$.
Are they congruent?

① $m\overset{\frown}{XY} = 65°$
   $m\overset{\frown}{WZ} = 65°$
② different circles ∴ they are not congruent since the radius of the inside circle is smaller
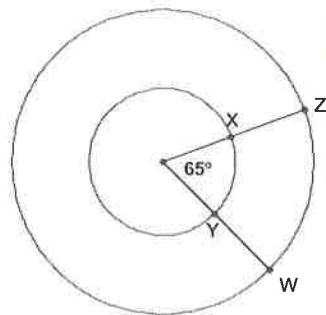
Even though $m\overset{\frown}{XY} = m\overset{\frown}{WZ}$, the arcs are not in $\cong$ circles so $\overset{\frown}{XY} \neq \overset{\frown}{WZ}$.

Find the measure of the arc or angle indicated.

17)

$m\angle A = \frac{1}{2}(80) = \boxed{40°}$

18)

$m\angle B = 180 - 49 = 70 = 61°$
$m\overset{\frown}{DC} = 61 \cdot 2 = \boxed{122°}$

19)

← 95·2 = 190°

$m\overset{\frown}{QS} = 360 - 190 - 75$
$\boxed{m\overset{\frown}{QS} = 95°}$

Solve for x

20)

← 18·2 = 36°

$\boxed{x = 18°}$
(both inscribed angles intercept same arc)

21)

← 49·2 = 98°
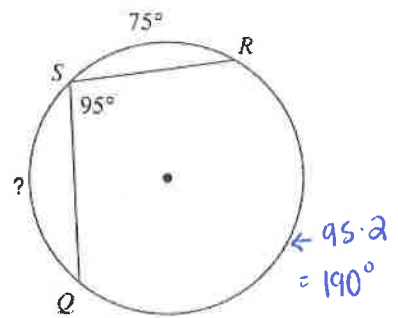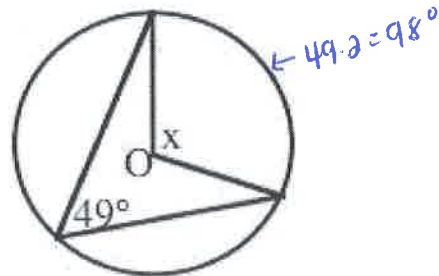
$\boxed{x = 98°}$ since ∠O is a central angle

Find the values of the missing variables.

22)

$7x + 1 + 105 = 180$
$7x + 106 = 180$
$7x = 74$
$\boxed{x = 10.57}$

$7y + 1 + 4y + 14 = 180$
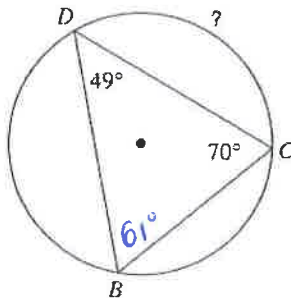$11y + 15 = 180$
$11y = 165$
$\boxed{y = 15}$

23)
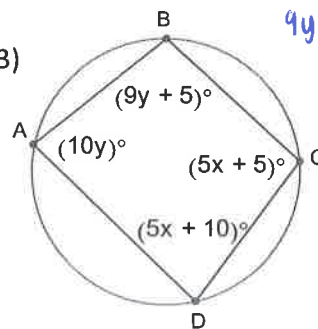
$9y + 5 + 5x + 10 = 180$
$9y + 5x = 165$
⇒ $5x = 165 - 9y$
$10y + 5x + 5 = 180$
$10y + 5x = 175$
⇒ $5x = 175 - 10y$
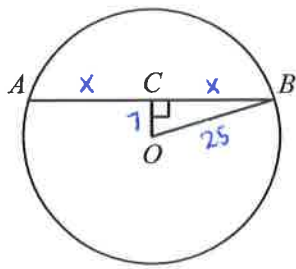
$165 - 9y = 175 - 10y$
$165 + y = 175$
$\boxed{y = 10}$

$5x = 175 - 100$
$5x = 75$
$\boxed{x = 15}$

24) Given $\odot O$ with radius 25 and $OC = 7$ and $AC = CB$, please find AB.

$7^2 + x^2 = 25^2$

$49 + x^2 = 625$

$x^2 = 576$

$x = 24$

$AB = 24 + 24$

$\boxed{AB = 48}$

25) The director of a telecast wants the option of showing the same scene from three different views. Explain why cameras in the position shown in the diagram will transmit the same scene.

Since the angles that the cameras make intercept the same arc, all 3 angles will have the same measure.

26) Harry is standing 35 feet from the center of a cylindrical statue with a radius of 6 feet. His lines of site form two tangents with the statue. What is the measure of the arc on the statue that Harry can see?
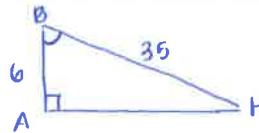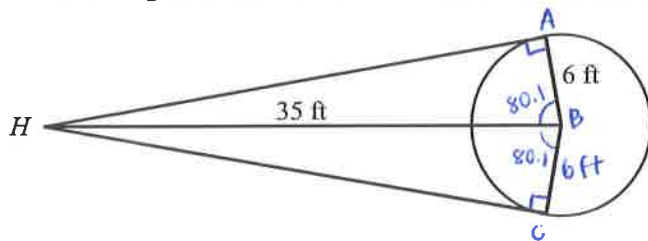
$\cos B = \dfrac{6}{35}$

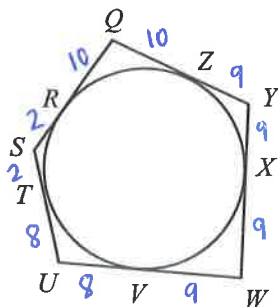$m\angle B = \cos^{-1}\left(\dfrac{6}{35}\right)$

$m\angle B = 80.1°$

Total $m\angle B = 80.1 + 80.1$

$\boxed{= 160.2°}$

Since the $m\angle B = 160.2°$ and angle B is the central angle, $m\overset{\frown}{AC} = 160.2°$ since the central angle is the same

27) The circle is circumscribed by the pentagon as shown (not drawn to scale). If $QZ = 10$, $YX = 9$, $XW = 9$, $UW = 17$, and $SU = 10$, find the perimeter of the pentagon.

Perimeter = 76 units