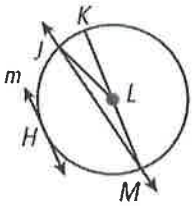
Geometry A
Review for Quiz on Properties of Circles (10.1, 10.2, 10.4)

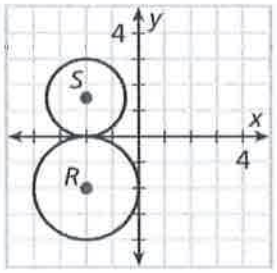
Name: Answer Key
Date: _____ Period: _____

1) **Identify each line or segment that intersects ⊙L.**

chords: $\overline{JM}$, $\overline{KM}$
secant: $\overleftrightarrow{JM}$
tangent: line m
diameter: $\overline{KM}$
radii: $\overline{LK}$, $\overline{LM}$, $\overline{LJ}$



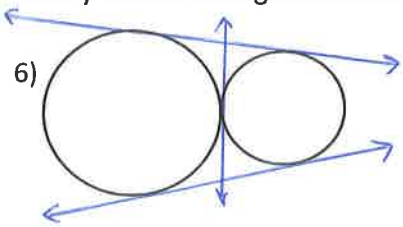
Use the diagram to the right to complete questions 3-6



2) Radius of ⊙S = 1.5 units
3) Diameter of ⊙S = 3 units
4) Radius of ⊙R = 2 units
5) Diameter of ⊙R = 4 units

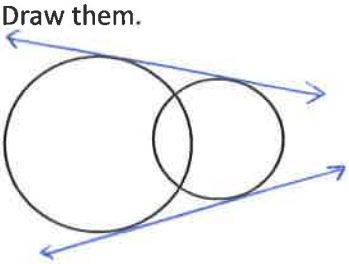
How many common tangents do the two circles have? Draw them.

6)



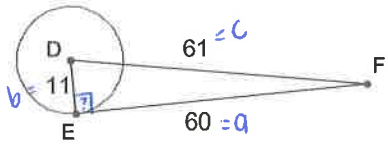
3 common tangents

7)



2 common tangents

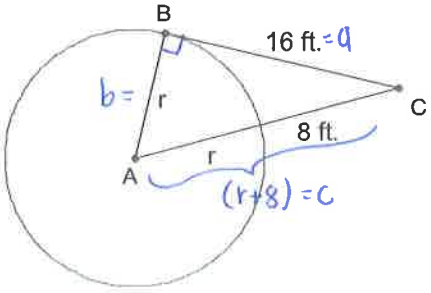
8) Is EF tangent to ⊙D?



$c^2 = a^2 + b^2$
$61^2 = 60^2 + 11^2$
$3721 = 3600 + 121$
$3721 = 3721$

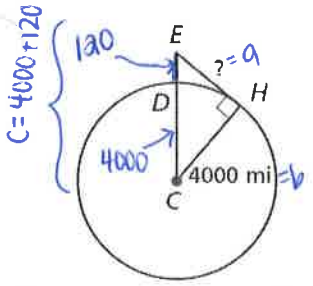
Yes, $\overline{EF}$ is tangent to ⊙D since $a^2 + b^2 = c^2$, so there is a right angle where $\overline{DE}$ and $\overline{EF}$ meet.

9) Find the radius of ⊙A



$a^2 + b^2 = c^2$
$16^2 + r^2 = (r+8)^2$
$256 + r^2 = (r+8)(r+8)$
$256 + r^2 = r^2 + 8r + 8r + 64$
$256 + r^2 = r^2 + 16r + 64$
$-r^2 \quad -r^2$
$256 = 16r + 64$
$-64 \quad -64$
$\frac{192}{16} = \frac{16r}{16} \Rightarrow$ **r = 12 ft**

10) Early in its flight, the Apollo 11 spacecraft orbited Earth 120 miles above the Earth's atmosphere. 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.



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

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

$x^2+16000000=16974400$

$-16000000 \quad -16000000$

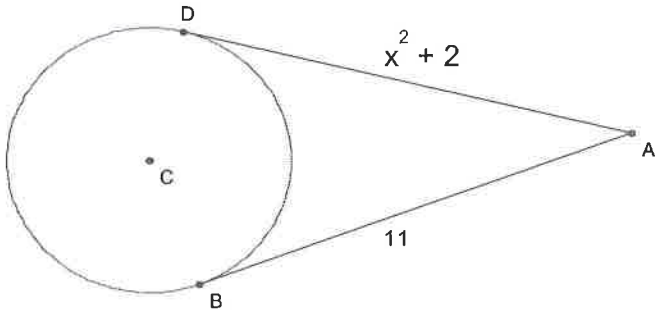
$\sqrt{x^2}=\sqrt{974400}$

$x=987$ miles

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

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

11) AB is tangent to ⊙C at B. AD is tangent to ⊙C at D. Find the value of x.



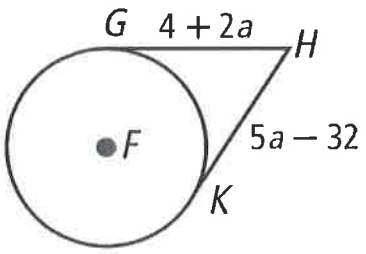
$x^2+2=11$

$\sqrt{x^2}=\sqrt{9}$

$x=3$ or $x=-3$

When you take the square root, you get both a positive and negative value

12) HK and HG are tangent to ⊙F. Find HG.



$4+2a=5a-32$

$-2a \quad -2a$

$4=3a-32$

$+32 \quad +32$

$\frac{36}{3}=\frac{3a}{3}$

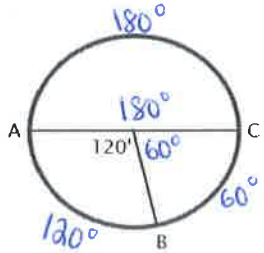
$a=12$

$HG=4+2(12)$

$HG=4+24$

$HG=28$

For the following questions use the following diagram



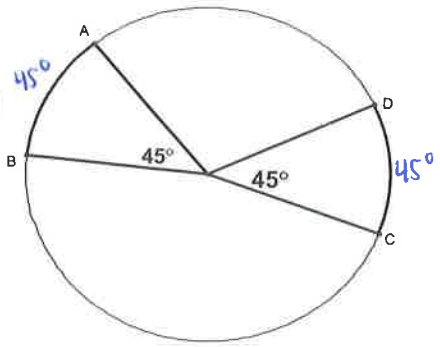
13) $\overset{\frown}{AB}=120°$ (120° is a central angle)

14) $\overset{\frown}{BC}=60°$ (ABC is a semicircle so $\overset{\frown}{BC}=180-120$)

15) $\overset{\frown}{CAB}=300°$ (the arc from C to A is 180° so $\overset{\frown}{CAB}=180+120$)

16) $\overset{\frown}{CBA}=180°$ (from C to B to A is a semicircle)

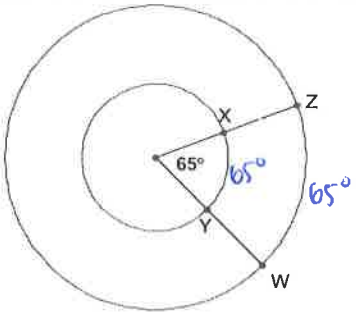
17) Find the measure of $\overset{\frown}{AB}$ and $\overset{\frown}{DC}$. Are they congruent?



① $m\overset{\frown}{AB} = 45°$ ② same circle
$m\overset{\frown}{DC} = 45°$

since the measures of the arcs are the same and they are in the same circle, then $\overset{\frown}{AB} \cong \overset{\frown}{CD}$.

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

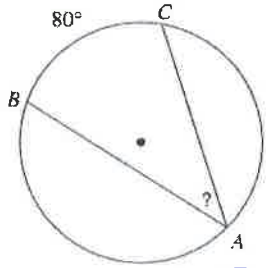


① $m\overset{\frown}{XY} = 65°$ ② different circles
$m\overset{\frown}{ZW} = 65°$ not congruent because the circle inside is smaller than the circle on the outside

Even though the measures of the arcs are the same, the arcs are not in congruent circles so $\overset{\frown}{XY} \neq \overset{\frown}{WZ}$.

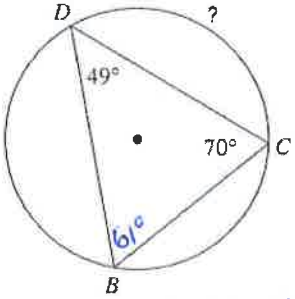
Find the measure of the arc or angle indicated.

19)



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

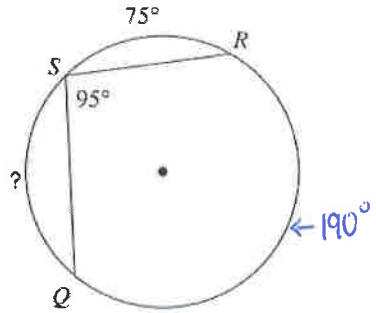
20)



Triangle sum: $m\angle B = 180 - 49 - 70 = 61°$

$m\overset{\frown}{DC} = 61 \cdot 2 = \boxed{122°}$

21)



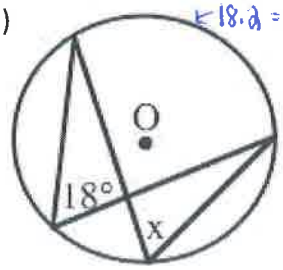
$m\overset{\frown}{QR} = 95 \cdot 2 = 190°$

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

$\boxed{m\overset{\frown}{QS} = 95°}$

Solve for x

22)

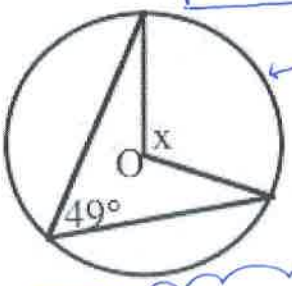


$\angle = 18 \cdot 2 = 36°$

$x = \frac{1}{2}(36)$

$\boxed{x = 18°}$

23)

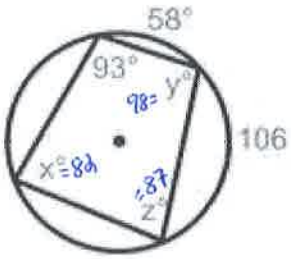


$\leftarrow 49 \cdot 2 = 98°$

$\boxed{x = 98°}$ since x is a central angle, the measure of the central angle is always the same as its intercepted arc

Find the values of the missing variables.

24)



$x = \frac{1}{2}(58+106)$

$x = \frac{1}{2}(164)$

$\boxed{x=82}$

$z+93=180$

$-93 \quad -93$

$\boxed{z=87}$

$y+82=180$

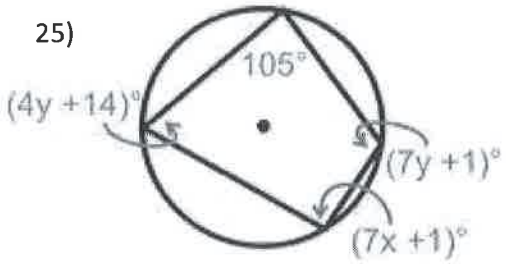
$-82 \quad -82$

$\boxed{y=98}$

x intercepts the whole arc from the 58° to the 106° so add together, then divide by 2

opposite angles in an inscribed quadrilateral are supplementary

25)



$4y+14+7y+1=180$

$11y+15=180$

$11y=165$

$\boxed{y=15}$

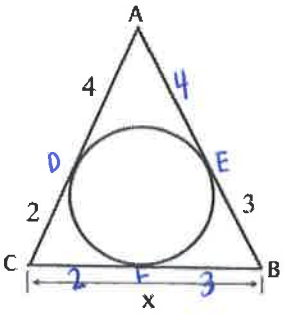
$105+7x+1=180$

$7x+106=180$

$7x=74$

$\boxed{x=10.57}$

26) In the figure, the segments that appear to be tangent are tangent. Find x and the perimeter of $\triangle ABC$.



$\overline{AD} \cong \overline{AE}$ so $AE = 4$

$\overline{BE} \cong \overline{BF}$ so $BF = 3$

$\overline{CD} \cong \overline{CF}$ so $CF = 2$

these are all tangents meeting at the same external point so the segments are congruent (think "party hat")

$x = 2+3$

$\boxed{x=5}$

Perimeter $= 2+4+4+3+3+2$

$\boxed{P = 18 \text{ units}}$

27) 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.

All 3 angles that are coming from the cameras intercept the exact same arc (the arc above the word "scene"). since all 3 angles intercept the same arc, they would be the same angle.