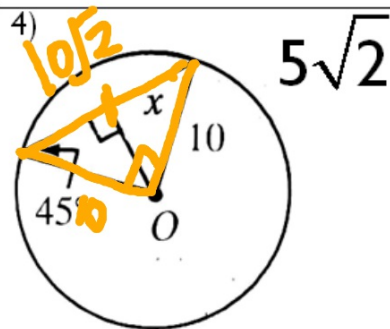
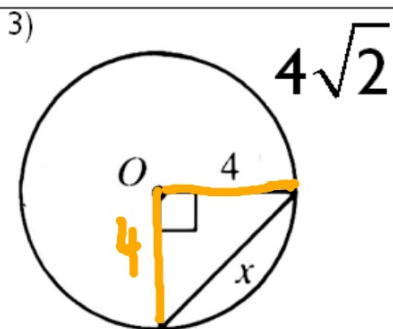
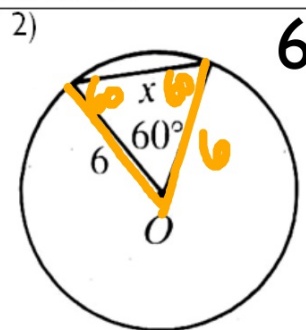
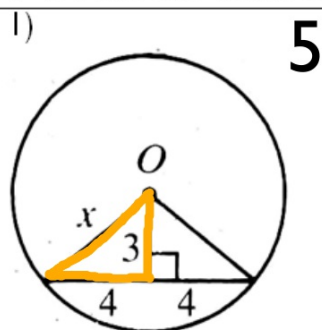


WARMUP #2

1-4: Find the value of x . O is the center of each circle.



1:1: $\sqrt{2}$

SECTION 9.2: TANGENTS

Standards:

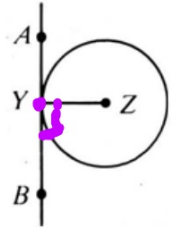
7.0 - Students prove and use theorems involving the properties of parallel lines cut by a transversal, the properties of quadrilaterals, and the properties of circles.

21.0 - Students prove and solve problems regarding relationships among chords, secants, tangents, inscribed angles, and inscribed and circumscribed polygons of circles.

THEOREM

If a line is tangent to a circle, then the line is perpendicular to the radius drawn to the point of tangency.

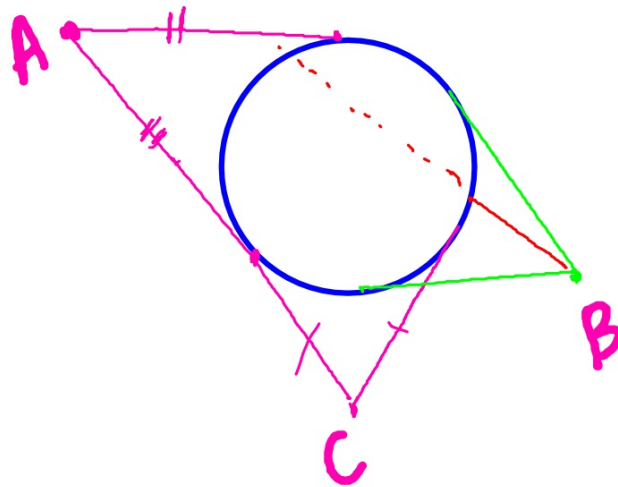
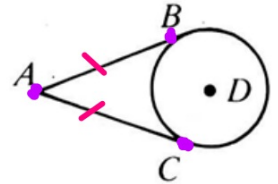
$$\overline{ZY} \perp \overline{AB}$$



COROLLARY

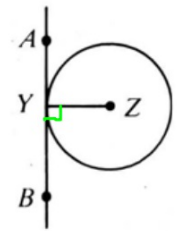
Tangents to a circle from a point are \cong

$$\overline{AB} \cong \overline{AC}$$



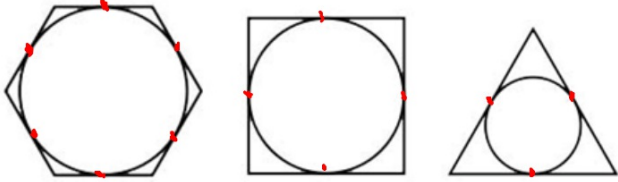
THEOREM

If a line in the plane of a circle is perpendicular to a radius at its outer endpoint, then the line is tangent to the circle.



\overline{AB} is tangent to circle Z at Y

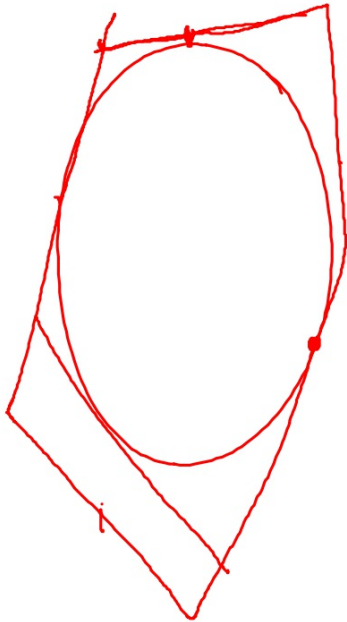
CIRCUMSCRIBED POLYGONS & INSCRIBED CIRCLES



When each side of a polygon
is tangent to a circle.

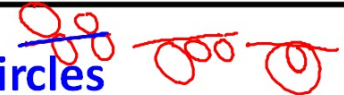
Inscribed = inside

Circumscribed = outside

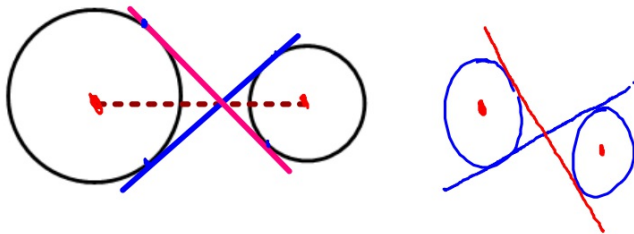


COMMON TANGENT

a line that is tangent to each of 2 coplanar circles

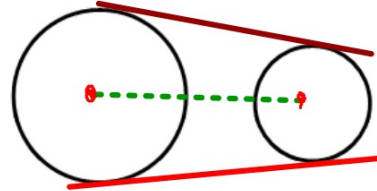


COMMON INTERNAL TANGENT



Intersects the segment joining the centers.

COMMON EXTERNAL TANGENT

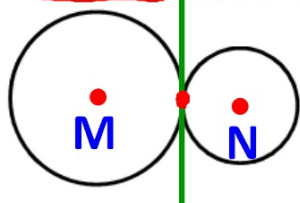


Does not intersect the segment joining the centers.

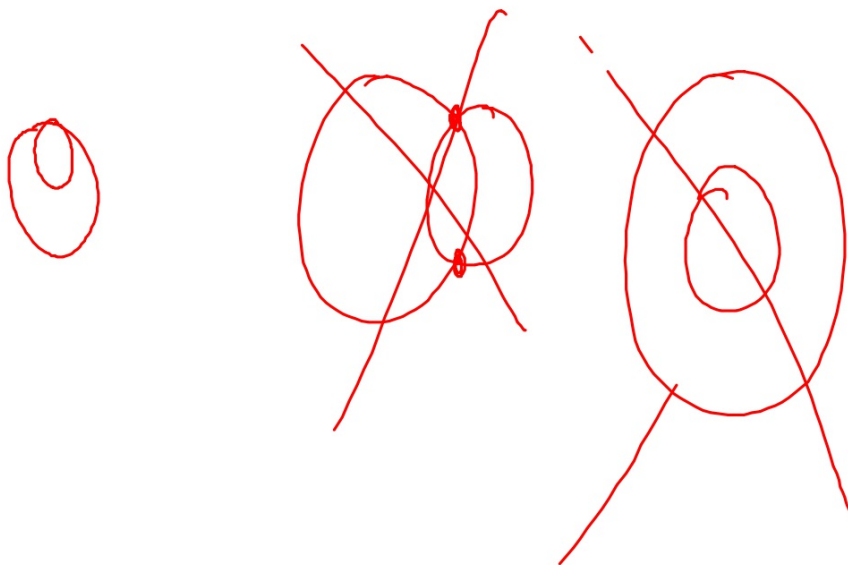
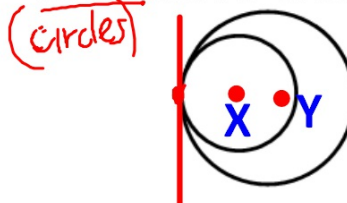
TANGENT CIRCLES

coplanar circles that are tangent to the same line at the same pt.

EXTERNALLY TANGENT CIRCLES

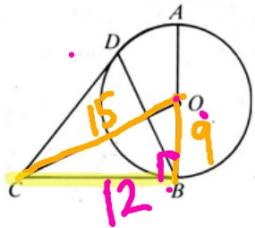


INTERNALLY TANGENT CIRCLES

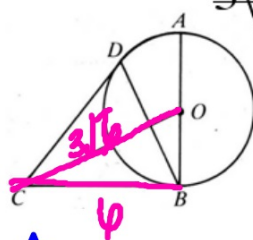


I-8: \vec{CB} and \vec{CD} are tangent to circle O at B and D , respectively. Complete.

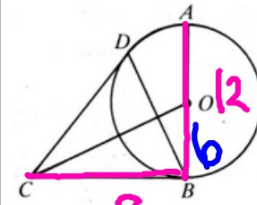
1) If $OC = 15$ and $OB = 9$, then $BC = \underline{12}$.



2) If $OC = 3\sqrt{6}$ and $BC = 6$, then $OB = \underline{3\sqrt{2}}$.

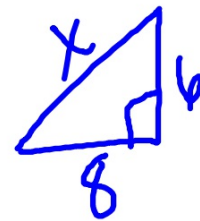


3) If $AB = 12$ and $BC = 8$, then $OC = \underline{10}$.



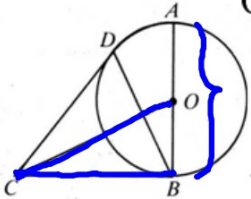
$$\begin{array}{r} 9 \text{ (X)} \overline{) 15} \\ \underline{3} \\ 3 \\ \underline{3} \\ 0 \end{array}$$

$$\begin{aligned} (3\sqrt{6})^2 &= 6^2 + y^2 \\ 54 - 36 &= y^2 \\ \sqrt{18} &= \sqrt{y^2} \end{aligned}$$

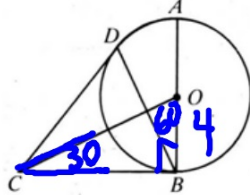


I-8: \overrightarrow{CB} and \overrightarrow{CD} are tangent to circle O at B and D , respectively. Complete.

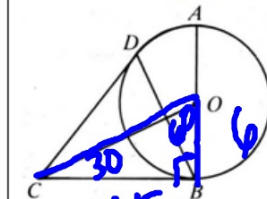
4) If $OC = 2\sqrt{17}$ and
 $BC = 5\sqrt{2}$, then
 $AB = \underline{\hspace{2cm}} \cdot 6\sqrt{2}$



5) If $m(\angle OCB) = 30$ and
 $OB = 4$, then
 $OC = \underline{8}$.



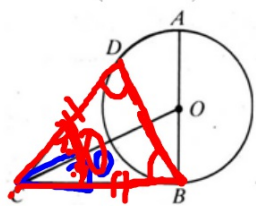
6) If $m(\angle COB) = 60$ and
 $CB = 6\sqrt{3}$, then
 $AB = \underline{12}$.



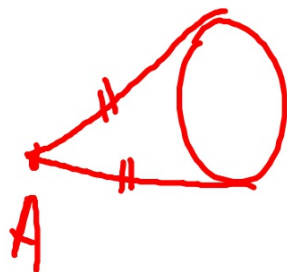
① $\sqrt{3}$ ②
 4 8

I-8: \overrightarrow{CB} and \overrightarrow{CD} are tangent to circle O at B and D , respectively. Complete.

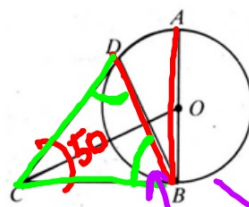
7) If $m(\angle BCD) = 70$, then
 $m(\angle CBD) = m(\angle CDB) = \underline{55}$.



$$180 - 70 = \frac{110}{2}$$



8) If $m(\angle BCD) = 50$, then $m(\angle DBO) = \underline{25}$.





$$\begin{array}{r} 180 \\ - 50 \\ \hline 130 \end{array}$$

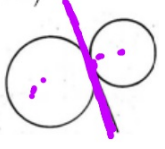
9-14: (a) Tell whether the circles are externally tangent, internally tangent, or not tangent.

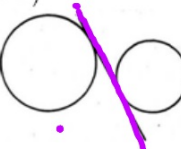
(b) Tell whether the line is a common external tangent, a common internal tangent, or neither.

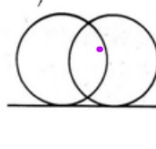
9)  a) not tangent
b) common ext. tangent

10)  a) int tangent
b) common ext tangent

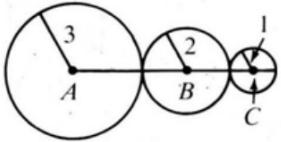
11)  a) not tangent
b) neither

12)  a) ext. tangent
b) common int tangent

13)  a) not tan
b) common int tan

14)  a) not tangent
b) common ext tan

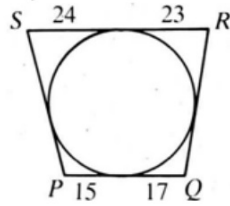
15) Find AC



AC = 8



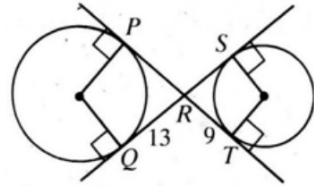
16) Find SP and RQ



SP = 39
RQ = 40



17) Find PT and QS



PT = QS = 22



HOMWORK

Assignment #9.2

- WS: Basic Terms; Tangents
- Pages 335-337 #1-6, 8a-c, 10, 17, 18

****TUES FEB 28th - QUIZ 9.1-9.4****

****FRI MARCH 2nd - CIRCLES QUIZ****

****MON MARCH 5th - QUIZ CH 9****

****WED MARCH 7th - TEST CH 9****

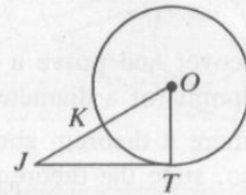
Assignment #9.2

■ WS: Basic Terms; Tangents

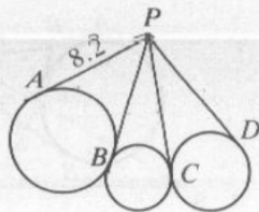
■ Pages 335-337 #1-6, 8a-c, 10, 17, 18

\overline{JT} is tangent to $\odot O$ at T . Complete.

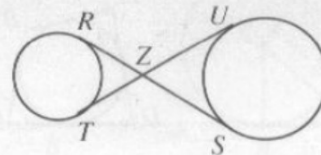
1. If $OT = 6$ and $JO = 10$, then $JT = \underline{\quad?}$.
2. If $OT = 6$ and $JT = 10$, then $JO = \underline{\quad?}$.
3. If $m\angle TOJ = 60$ and $OT = 6$, then $JO = \underline{\quad?}$.
4. If $JK = 9$ and $KO = 8$, then $JT = \underline{\quad?}$.



5. The diagram below shows tangent lines and circles. Find PD .



6. \overline{RS} and \overline{TU} are common internal tangents to the circles. If $RZ = 4.7$ and $ZU = 7.3$, find RS and TU .



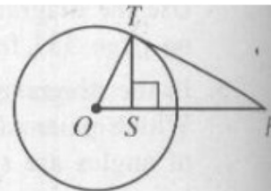
8. Given: \overline{TR} and \overline{TS} are tangents to $\odot O$ from T ;
 $m\angle RTS = 36$

- Copy the diagram. Draw \overline{RS} and find $m\angle TSR$ and $m\angle TRS$.
- Draw radii \overline{OS} and \overline{OR} and find $m\angle ORS$ and $m\angle OSR$.
- Find $m\angle ROS$.
- Does your result in part (c) support one of your conclusions about angles in Classroom Exercise 5? Explain.

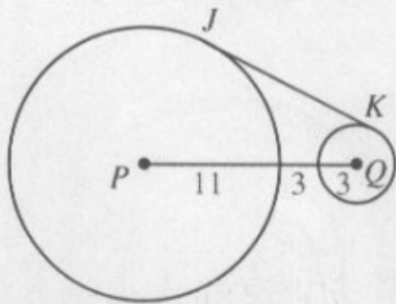


10. Given: \overline{PT} is tangent to $\odot O$ at T ; $\overline{TS} \perp \overline{PO}$
 Complete the following statements.

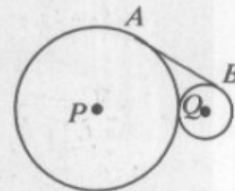
- TS is the geometric mean between $\frac{?}{?}$ and $\frac{?}{?}$.
- TO is the geometric mean between $\frac{?}{?}$ and $\frac{?}{?}$.
- If $OS = 6$ and $SP = 24$, $TS = \frac{?}{?}$ and $TP = \frac{?}{?}$.



17. \overline{JK} is tangent to $\odot P$ and $\odot Q$.
 $JK = \underline{\hspace{1cm}}?$ (Hint: What kind of quadrilateral is $JPQK$?)



18. Circles P and Q have radii 6 and 2 and are tangent to each other. Find the length of their common external tangent \overline{AB} .
 (Hint: Draw \overline{PQ} , \overline{PA} , and \overline{QB} .)



A Option 1

B Option 2

C Option 3

9-14: (a) Tell whether the circles are externally tangent, internally tangent, or not tangent. (b) Tell whether the line is a common external tangent, a common internal tangent, or neither.

9) 10) 11) 12) 13) 14)

Multiple Choice-A-C
1 response

A Option 1

B Option 2

C Option 3

9-14: (a) Tell whether the circles are externally tangent, internally tangent, or not tangent. (b) Tell whether the line is a common external tangent, a common internal tangent, or neither.

9) 10) 11) 12) 13) 14)

Multiple Choice-A-C
1 response

