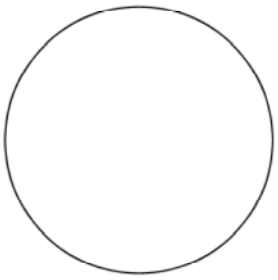
Circles – A Circular Experience 12.06

- Label the circle shown circle T.
- Draw a ray from center T to the given point P outside of the circle and label the point of intersection A.
- Draw a line through A perpendicular to $\overrightarrow{TP}$. This line is said to be tangent to the circle. Point A is the point of tangency.



P

D

1. What is segment TA called? _____
2. Pick a point on the perpendicular line above A and label it C. ∠TAC = _____
   A radius drawn to the point of tangency is always perpendicular to the tangent.

- Draw a second ray from center T to given point D outside of circle T and label the intersection of the ray with the circle point U.
- Draw a line through U perpendicular to $\overrightarrow{TD}$ such that both perpendiculars intersect at B outside the circle.

3. What is segment TU called? _____

4. Using a ruler, measure $\overline{AB}$ and $\overline{UB}$. AB = ____ and UB = ____

5. What is $\overleftrightarrow{UB}$ called? _____

6. What is point U called? _____

- Draw segment TB.

7. What would always be true about a) ΔTUB and ΔTAB ? _____

   b) ∠UBT and ∠ABT ? _____

8. Let ∠UBA = 60° and let TU = 10 cm. Find

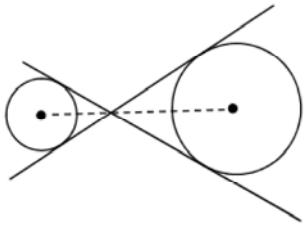
   a) ∠TUB = _____ c) ∠UBT = _____ e) TB = _____

   b) ∠BTU = _____ d) UB = _____

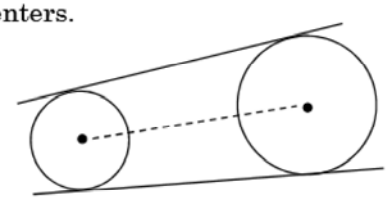
Circles – Common Tangents 12.07

A line tangent to each of two coplanar circles is called a common tangent.

Common internal tangents intersect the segment joining the centers.



Common external tangents do not intersect the segment joining the centers.



1. Draw two circles so that the total number of common tangents is exactly

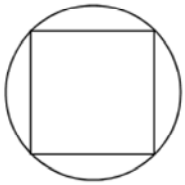
a) Four b) Three c) Two

d) One e) None

When each side of a polygon is tangent to a circle, the polygon is said to be circumscribed about the circle. The circle is inscribed in the polygon.

The circle is inscribed in the triangle.

The triangle is circumscribed about the circle.



The square is inscribed in the circle.

The circle is circumscribed about the square.

2. a) Draw a circle inscribed in a square

b) Draw a circle circumscribed about a hexagon

c) Draw a triangle inscribed in a circle

d) Draw a circle circumscribed about an octagon

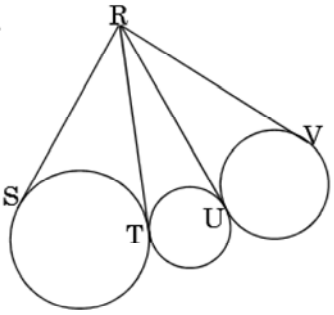
Circles – Using Tangents 12.08

1. Draw several circles tangent to line k at point D.

   a) How many circles can be drawn? _____

   b) What do the centers of the tangent circles make? _____

2. All segments are tangent to the circles.



   RS = 10

   a) RT = _____

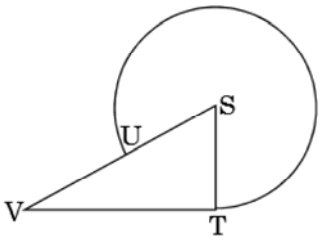
   b) RV = _____

3. $\overline{VT}$ is tangent to circle S

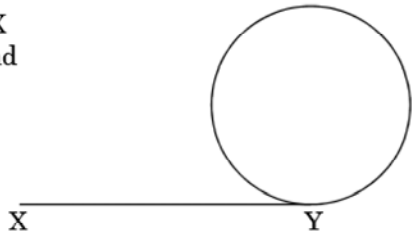
   a) If SV = 13 and ST = 5, then VT = _____

   b) If ∠SVT = 30° VS = 40, then ST = _____

   c) If ∠SVT = 45° and ST = 5, then SV = _____



4. XY = 10 cm. The distance from point X to the center of the circle is 16 cm. Find the length of a radius of the circle.



5. AD = 8

   Find the perimeter of ΔABC

   Hint: How many common tangents contain point B ? point C ?