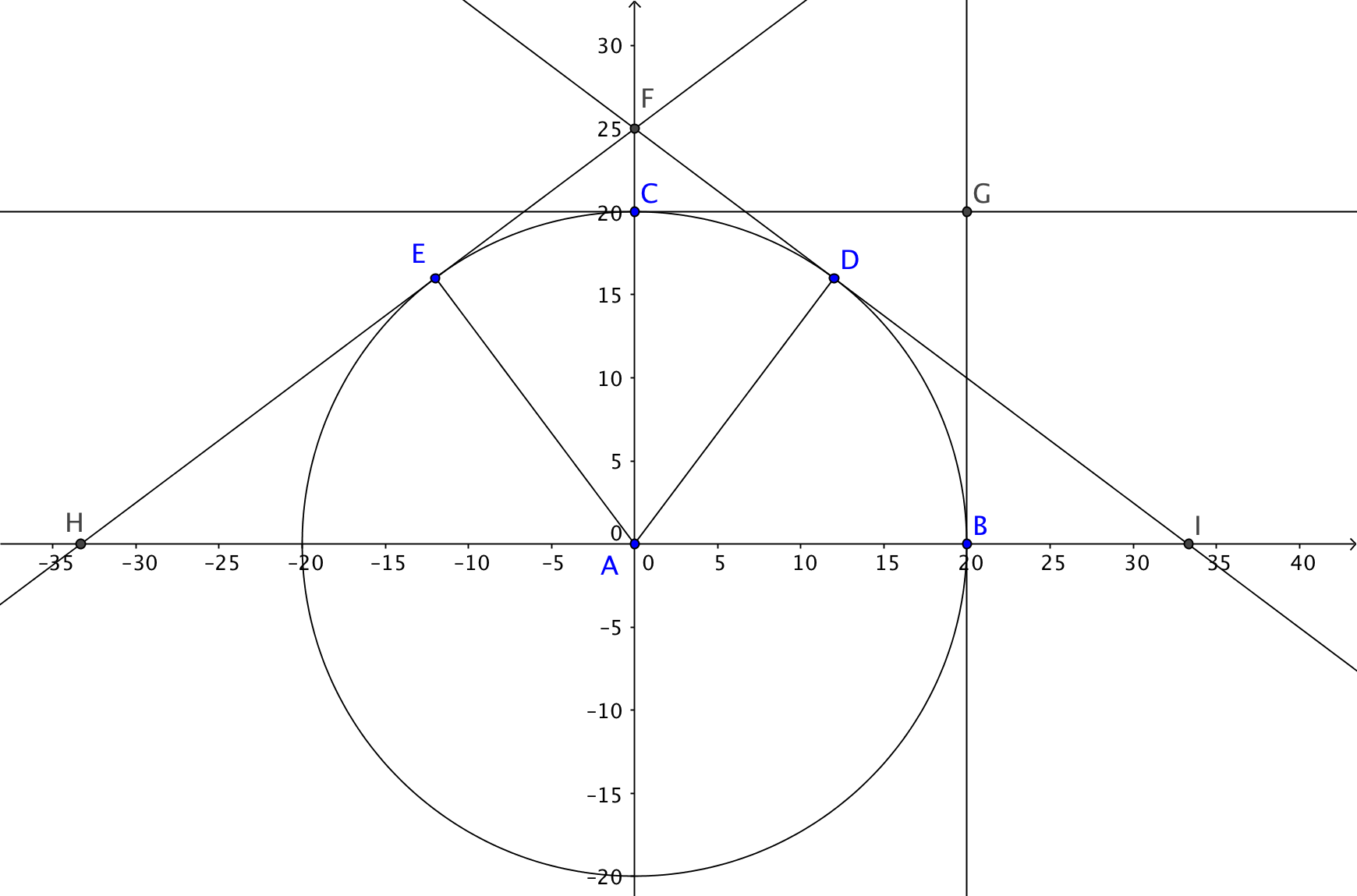
**Activity 5.4.5 Tangents in the Coordinate Plane**



Circle *A* is centered at the origin with equation

1. Points *B, C, D,* and *E* lie on the circle. Their *x*-coordinates are given. Find the *y* coordinates.

*B*(20, \_\_\_\_\_)   
*C*(0, \_\_\_\_\_)   
*D*(12, \_\_\_\_\_)   
*E*(–12, \_\_\_\_\_)

2. Find the slopes of each of the radii drawn:

Slope of = \_\_\_\_\_\_\_\_\_\_\_ Slope of = \_\_\_\_\_\_\_\_\_

Slope of = \_\_\_\_\_\_\_\_\_\_\_ Slope of = \_\_\_\_\_\_\_\_\_

3. , , , and are tangents to the circle. Find the slopes of each of these tangent lines.

Slope of = \_\_\_\_\_\_\_\_\_\_\_ Slope of = \_\_\_\_\_\_\_\_\_

Slope of = \_\_\_\_\_\_\_\_\_\_\_ Slope of = \_\_\_\_\_\_\_\_\_

4. What theorem did you use to answer question 3?

5. Find the equations of tangent lines and :

Equation of \_\_\_\_ = 20 Equation of \_\_\_\_ = 20

6. Find the equations of tangent lines and (Hint: recall the point-slope form of the equation of a line:

Equation of : Equation of :

7. Find the coordinates of point *F*, the intersection of and

8. Find the lengths of tangent segments and . What do you notice? What theorem does this illustrate?