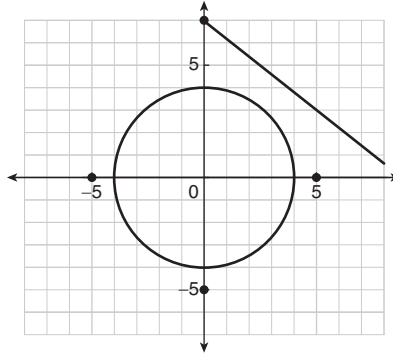


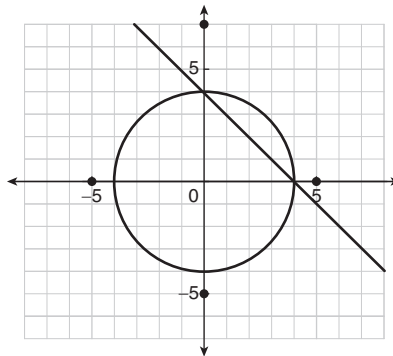
Reasoning With Equations and Inequalities

1. Consider the circle $x^2 + y^2 = 16$ and lines with a slope of -1 .

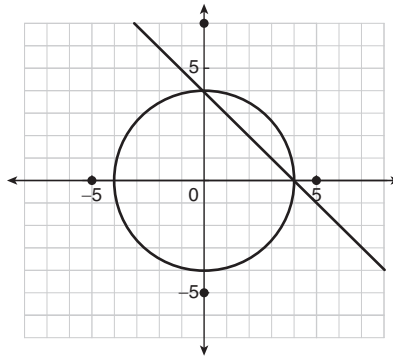
a. Find the equation of this line for which there is not a point of intersection for the line and circle.



b. Find the equation of this line for which there are two points of intersection for the line and circle.



c. Find the equation of this line for which there is one point of intersection for the line and circle.



2. For what values of a will $x - y = a$ have no intersections with the graph of the circle? Explain your reasoning.

3. For what values of a will $x - y = a$ have two intersections with the graph of the circle? Explain your reasoning.

4. For what values of a will $x - y = a$ have one intersection with the graph of the circle? Explain your reasoning.

5. Using the circle $x^2 + y^2 = 16$, find the equation of a line that intersects the circle in two points and that has a slope of 2.

6. Using the circle $x^2 + y^2 = 16$, find the equation of a line that intersects the circle in two points and that has a slope of $-\frac{1}{2}$.

7. How can you generalize your solution process so that it works for a line with slope m ?

8. Using the circle $x^2 + y^2 = 16$, find the equation of a tangent that has slope of 2. Explain your reasoning.

9. Qua is using the equation $(x - 3)^2 + (y + 2)^2 = 9$. He considers the line $y = 2x$. He substitutes $y = 2x$ into the circle equation and solves. What solution should he get? What do his results mean?