Geometry   10.8
Write the equation of a circle
Graph a circle on the coordinate plane
Find intersections

Standard form

circle
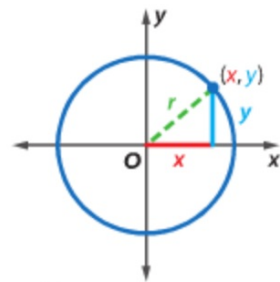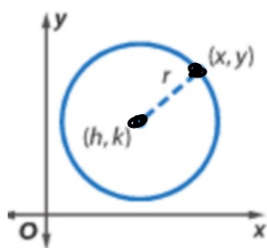center $(2, 5)$ $(x-2)^2 + (y-5)^2 = 36$
radius
                    6

pythagorean theorem (distance)
Factoring/Completing the Square (alg 1)
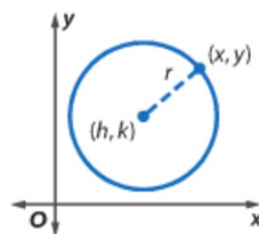   CTS

Distance from (x,y) to (h,k)
(pythagorean theorem)

KeyConcept Equation of a Circle in Standard Form

The standard form of the equation of a circle with center at (h, k) and radius r is $(x - h)^2 + (y - k)^2 = r^2$.

The standard form of the equation of a circle is also called the *center-radius* form.
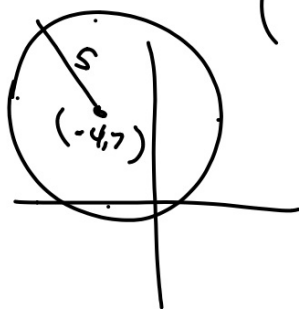
$C(0,0)$ $r=2$

GuidedPractice

For each circle with the given equation, state the coordinates of the center and the measure of the radius. Then graph the equation.

3A. $x^2 + y^2 \overset{+4}{-4} = 0 \,^{+4}$

3B. $x^2 + y^2 \boxed{+ 8x - 14y} + 40 = 0$

$(x-0)^2 + (y-0)^2 = 4$

$(x^2 + 8x + 16) + (y^2 - 14y + 49) = -40 \overset{+49}{+16}$

$(x+4)^2 + (y-7)^2 = 25$

$C(-4, 7) \qquad r = 5$

Example 5 Intersections with Circles

Find the point(s) of intersection between $x^2 + y^2 = 9$ and $y = x + 1$

(0, 0)

Graph & Estimate
(how many ans??)
Solve w. Substitution or
Elimination (Alg1)

$$x^2 + (x + 1)^2 = 9$$

$$x^2 + (x^2 + 2x + 1) = 9$$

$$\underset{a}{2}x^2 + \underset{b}{2}x \underset{c}{-8} = 0$$

$x + 1$
$x + 1$
_____
x^2 $x + 1$
    x

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-2 \pm \sqrt{4 - 4 \cdot 2 \cdot -8}}{4}$$
$$\quad\quad\quad \overset{+64}{}$$

$$x = \frac{-2 \pm \sqrt{68}}{4}$$

$$x = \frac{-2 + 8.2}{4} \qquad x = \frac{-2 - 8.2}{4}$$

$$x \approx 1.6 \qquad\qquad x \approx -2.6$$

(1.6, 2.6)

(-2.6, -1.6)

(1.6, -2.6)
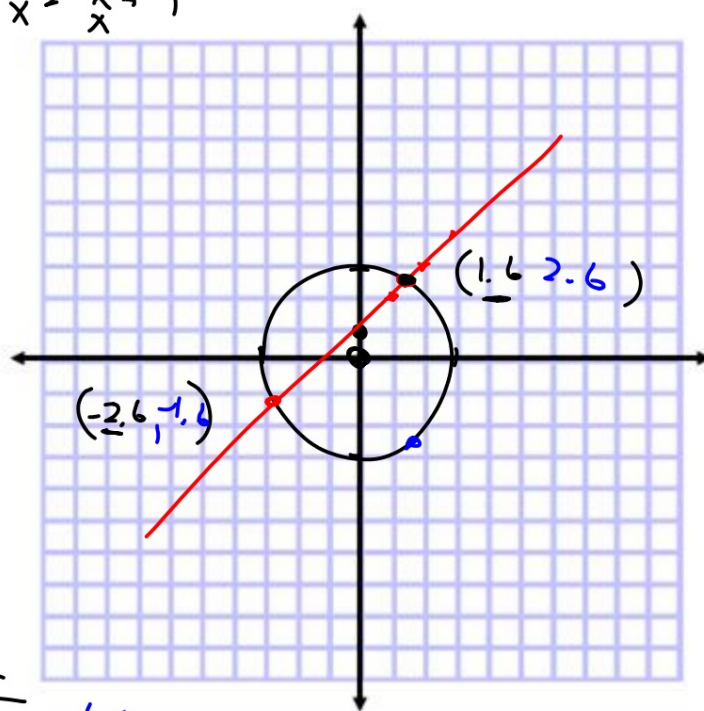
Write equations using 3 points...
:(

5. Find the point(s) of intersection between $x^2 + y^2 = 8$ and $y = -x.$ $+ 0$
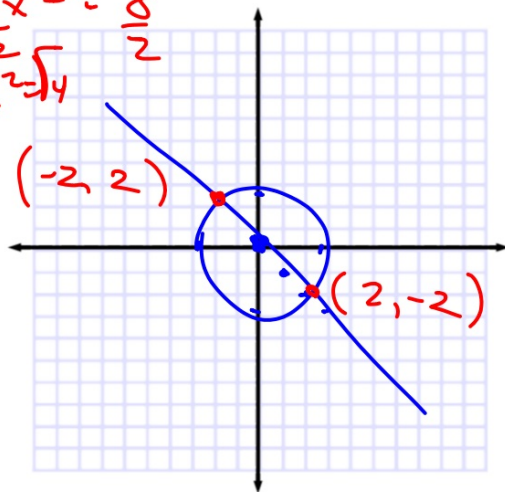
$= $

$(0, 0)$

$x^2 + (-x)^2 = 8$

$x^2 + x^2 = 8$

$2x^2 = 8$

$\dfrac{2x^2}{2} = \dfrac{8}{2}$

$\sqrt{x^2} = \sqrt{4}$

$x = \pm 2$

$(-2, 2)$

$y = -(2)$

$y = -(-2)$

$(2, -2)$

WB 10.8
  pr. 1-8
  sk 1-10