

Geometry 10.8

Write the equation of a circle

Graph a circle on the coordinate plane

Find intersections

circle
center
radius

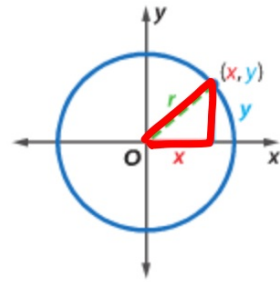
$$(x - h)^2 + (y - k)^2 = r^2$$

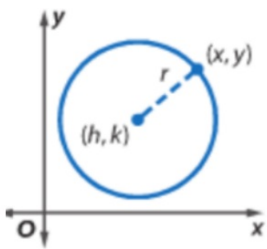
$$(x + 2)^2 + (y - 4)^2 = 9$$

pythagorean theorem (distance)

Factoring/Completing the Square (alg 1)

$$(x - h)^2 + (y - k)^2 = r^2$$



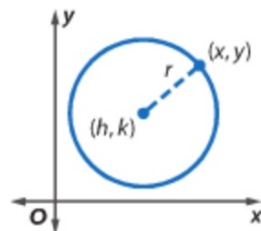


Distance from (x, y) to (h, k)
(pythagorean theorem)

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.



CTS Whiteboards

Guided Practice

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

3A. $x^2 + y^2 - 4 = 0$
 $=$ $+4$ $+4$

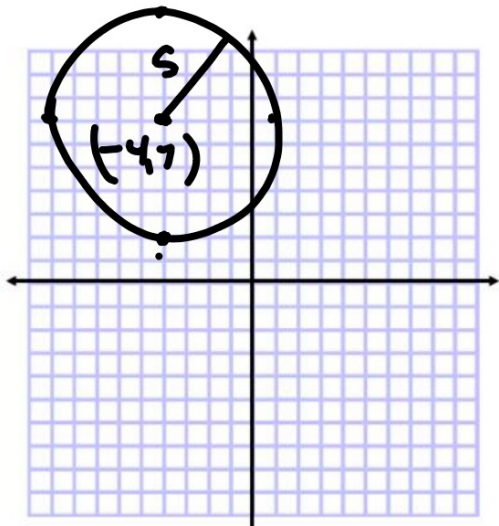
3B. $x^2 + y^2 + 8x - 14y + 40 = 0$

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

$$(x^2 + 8x + 16) + (y^2 - 14y + 49) = -40 + 16 + 49$$

$$\text{C}(0,0) \quad r=2 \quad \xrightarrow{\text{SF}} \quad (x+4)^2 + (y-7)^2 = 25$$

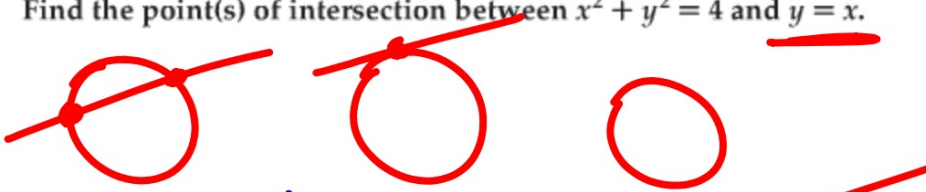
$$\text{C}(-4,7) \quad r=5$$



Example 5 Intersections with Circles

Find the point(s) of intersection between $x^2 + y^2 = 4$ and $y = x$.

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



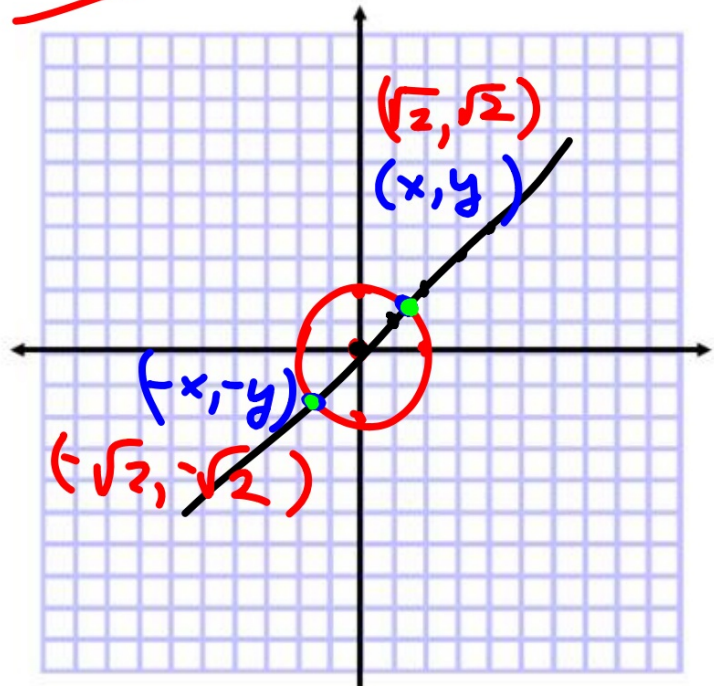
$$x^2 + y^2 = 4$$

$$y = x$$

$$x^2 + x^2 = 4$$

$$2x^2 = 4$$

$$\sqrt{\frac{2}{2}} x^2 = \sqrt{\frac{4}{2}} \quad x = \pm\sqrt{2}$$



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

$$x^2 + y^2 = 8$$

$$y = mx + b$$

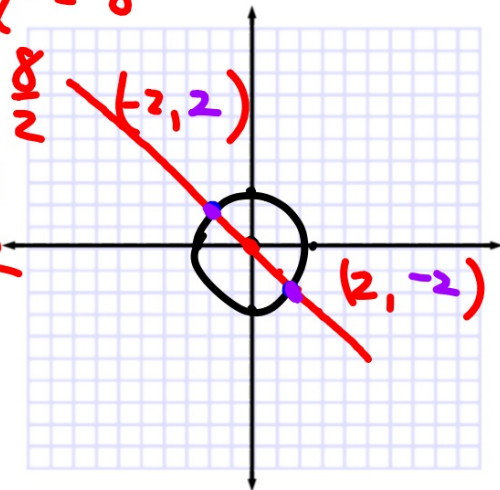
$$y = -x$$

$$x^2 + x^2 = 8$$

$$2x^2 = 8$$

$$x^2 = 4$$

$$x = \pm 2$$



$$x^2 + y^2 + 12x + 8y + \overset{\curvearrowright}{20} = 0 \quad -20$$

$$(x^2 + 12x + 36) + (y^2 + 8y + 16) = -20 + 36 + 16$$

$$(x+6)^2 + (y+4)^2 = 32$$

$$C(-6, -4) \quad r \approx 5.7$$

WB pr. 1-8
sk. 1-10

1-6, 9-10 3 (x, y)