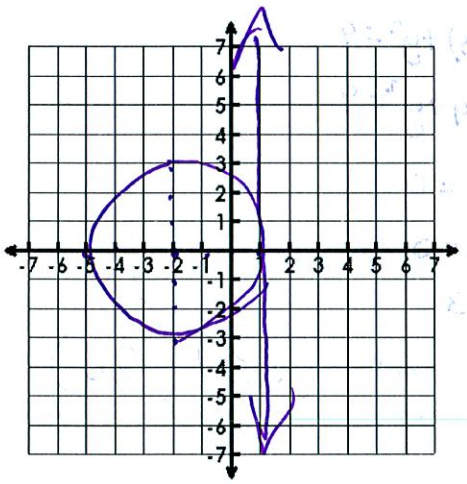
Name: Key Date: _____

Intersections of Circles & Lines – Homework

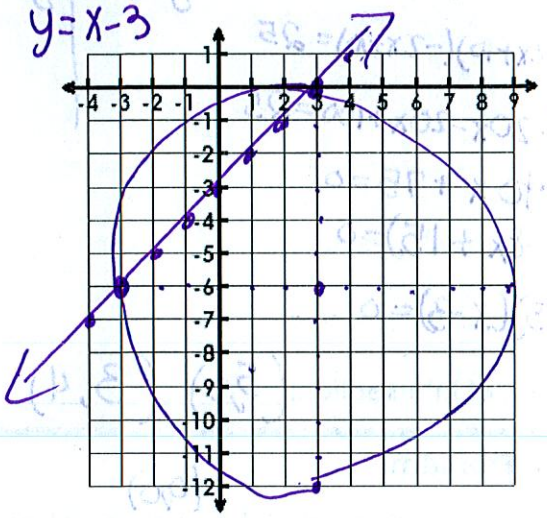
Solve by graphing and find the point(s) of intersection. If there are none, write "none."

1. $(x+2)^2 + y^2 = 9$ C: (-2, 0) r = 3
   $x = 1$



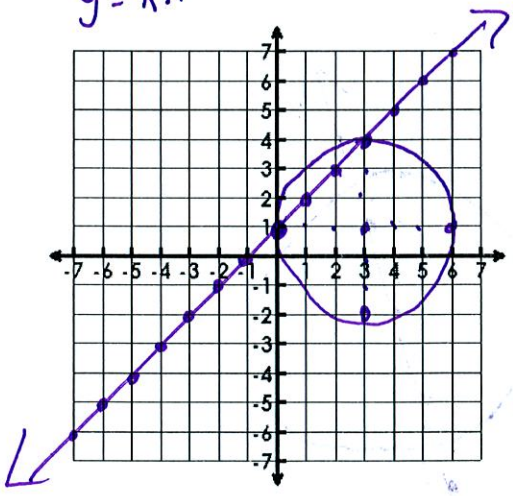
Point(s) of Intersection: (1, 0)

2. $(x-3)^2 + (y+6)^2 = 36$ C: (3, -6) r = 6
   $y + 3 = x$
   y = x - 3



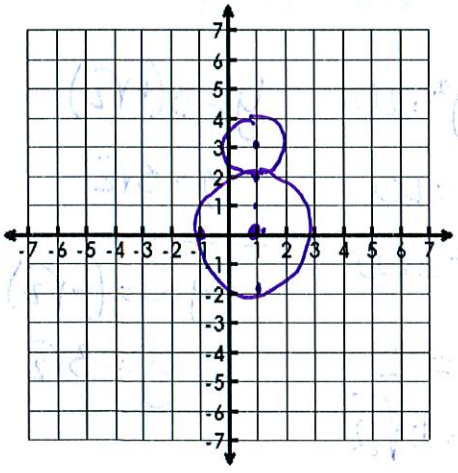
Point(s) of Intersection: (-3, -6) (3, 0)

3. $(x-3)^2 + (y-1)^2 = 9$ C(3, 1) r = 3
   $y - 1 = x$
   y = x + 1



Point(s) of Intersection: (0, 1) (3, 4)

4. $(x-1)^2 + y^2 = 4$ C: (1, 0) r = 2
   $(x-1)^2 + (y-3)^2 = 1$ C: (1, 3) r = 1



Point(s) of Intersection: (1, 2)

Find the point(s) of intersection by solving algebraically. Show all of your work.

5. $x^2 + y^2 = 25$
$2x + y = 10$

$y = -2x + 10$

$x^2 + (-2x+10)^2 = 25$

$x^2 + (-2x+10)(-2x+10) = 25$

$x^2 + 4x^2 - 20x - 20x + 100 = 25$

$5x^2 - 40x + 75 = 0$

$5(x^2 - 8x + 15) = 0$

$5(x-5)(x-3) = 0$

$x = 5$ | $x = 3$

$y = -2(5) + 10$ | $y = -2(3) + 10$

$y = -10 + 10$ | $y = -6 + 10$

$y = 0$ | $y = 4$

Point(s) of Intersection: (5,0) (3,4)

6. $x^2 + y^2 = 9$
$x + y = 3$

$x = -y + 3$

$(-y+3)^2 + y^2 = 9$

$(-y+3)(-y+3) + y^2 = 9$

$y^2 - 3y - 3y + 9 + y^2 = 9$

$2y^2 - 6y = 0$

$2y(y-3) = 0$

$y = 0$ $y = 3$

$y = 0$ | $y = 3$

$x = -0 + 3$ | $x = -3 + 3$

$x = 3$ | $x = 0$

Point(s) of Intersection: (0,3) (3,0)

Word Problem

7. A circle is centered at the origin (0,0) and has a radius of $2\sqrt{5}$ units. A line with a slope of 3 passes through the origin and intersects the circle in two places. Where does the line intersect the circle?

Write the equation of the circle: $x^2 + y^2 = 20$

Write the equation of the line: $y = 3x$

Find solutions algebraically

$x^2 + (3x)^2 = 20$

$x^2 + 9x^2 = 20$

$10x^2 = 20$

$x^2 = 2$

$x = \pm\sqrt{2}$

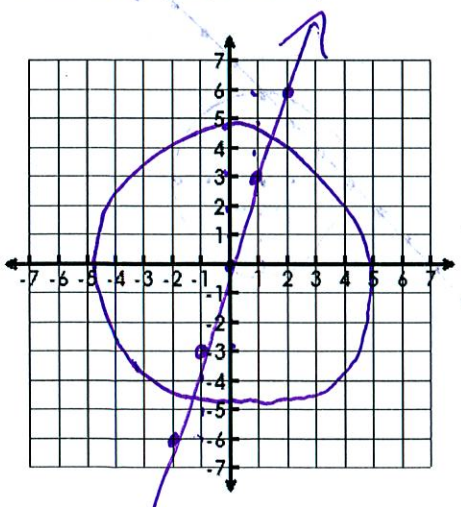
$y = 3(+\sqrt{2})$

$y = 3\sqrt{2}$

$y = 3(-\sqrt{2})$

$y = -3\sqrt{2}$

Find solutions graphically



Point(s) of Intersection: $(\sqrt{2}, 3\sqrt{2})$ $(-\sqrt{2}, -3\sqrt{2})$ **Point(s) of Intersection:** _____