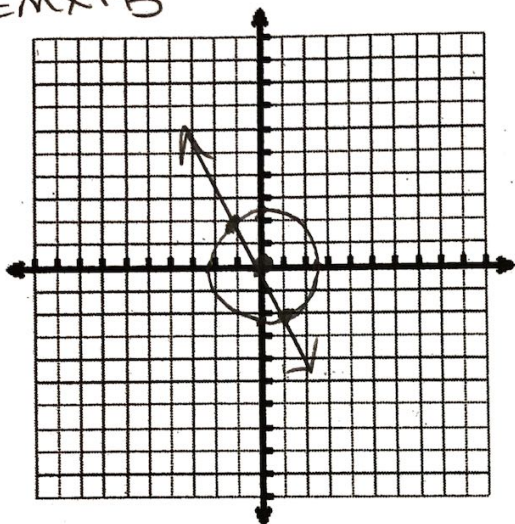


Systems of Conics WS 1
A Circle and A Line

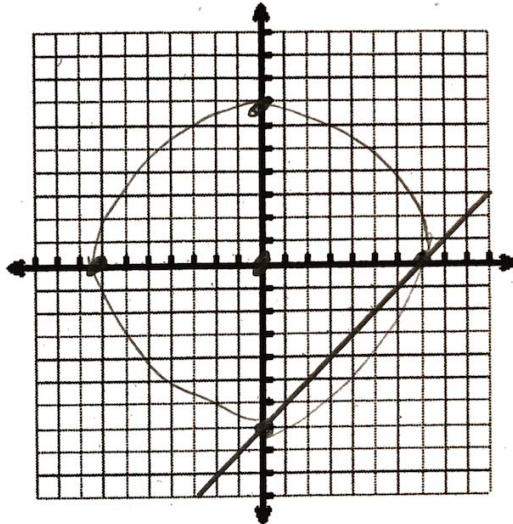
Name _____

Solve the system graphically. Find the points of intersection, if any.

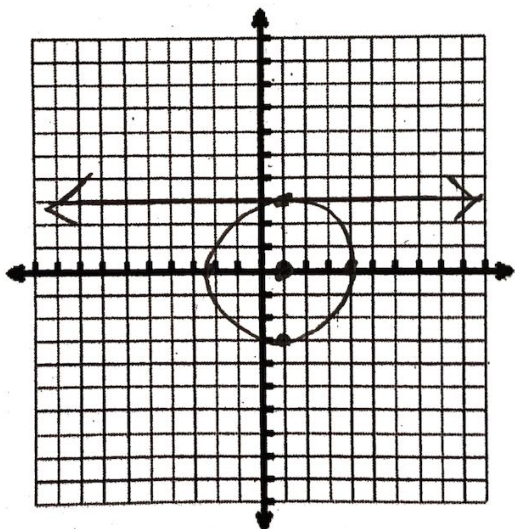
1. $x^2 + y^2 = 5$ Center $(0,0)$ $r = \sqrt{5}$
 $y = -2x$ $m = -\frac{2}{1}$ $(-1,2)$ $(1,-2)$
 $y = mx + b$



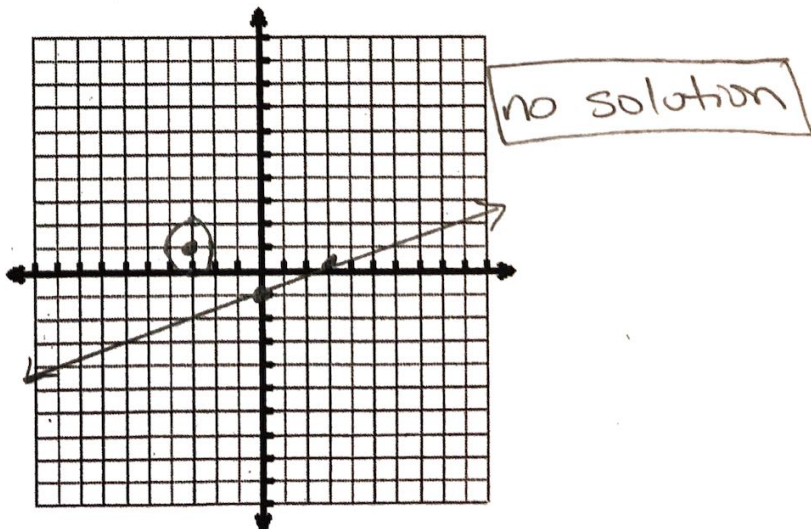
2. $x^2 + y^2 = 49$ $C(0,0)$ $r = 7$
 $y = x - 7$ $m = 1$ $(0,-7)$ $(7,0)$



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



4. $(x+3)^2 + (y-1)^2 = 1$ $C(-3,1)$ $r = 1$
 $x - 3y = 3 \Rightarrow \frac{-3y}{-3} = \frac{-x+3}{-3}$ $y = \frac{1}{3}x - 1$



Solve the system algebraically.

5. $x^2 + y^2 = 18$
 $x - y = 0 \Rightarrow y = x$

$x^2 + x^2 = 18$

$2x^2 = 18$

$x^2 = 9$

$x = \pm 3$

$x = 3$

$y = 3$

$(3, 3)$

$x = -3$

$y = -3$

$(-3, -3)$

6. $x^2 + y^2 = 25$
 $y = x + 1$

$x^2 + (x+1)^2 = 25$

$x^2 + (x+1)(x+1) = 25$

$x^2 + x^2 + 2x + 1 = 25$

$2x^2 + 2x - 24 = 0$

$x^2 + x - 12 = 0$

$(x-3)(x+4) = 0$

$x = 3$

$y = 3 + 1$

$y = 4$

$x = -4$

$y = -4 + 1$

$y = -3$

$(3, 4)$

$(-4, -3)$

7. $x^2 - 2x + y^2 - 2y = 2$
 $x + y = 4 \Rightarrow y = -x + 4$

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

$x^2 - 2x + (-x+4)(-x+4) + 2x - 8 - 2 = 0$

$x^2 - 2x + x^2 - 8x + 16 + 2x - 10 = 0$

$2x^2 - 8x + 6 = 0$

$x^2 - 4x + 3 = 0$

$(x-1)(x-3) = 0$

$x = 1$

$y = -1 + 4$

$y = 3$

$x = 3$

$y = -3 + 4$

$y = 1$

$(1, 3)$

$(3, 1)$

8. $x^2 + y^2 - 4x - 6y = -9$

$x + y = 1 \Rightarrow y = -x + 1$

$x^2 + (-x+1)^2 - 4x - 6(-x+1) = -9$

$x^2 + (-x+1)(-x+1) - 4x + 6x - 6 = -9$

$x^2 + x^2 - 2x + 1 + 2x + 3 = 0$

$2x^2 + 4 = 0$

$2x^2 = -4$

$x^2 = -2$

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

$x = \pm i\sqrt{2}$

No Solution

graphs do not intersect

Answers:

1. $(-1, 2), (1, -2)$

5. $(3, 3), (-3, -3)$

2. $(7, 0), (0, -7)$

6. $(-4, -3), (3, 4)$

3. $(1, 3)$

7. $(3, 1), (1, 3)$

4. no solution

8. no solution