Day 2 In Class Notes

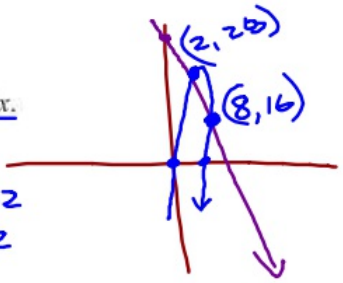
1) Kate and Sara are at hockey practice.
Kate sends Sara the puck following a path described by $y = -2x + 32$.
Sara is traveling in a curve around the rink on a path described by $y = -2x^2 + 18x$.
Find all points where Sara will be able to pick up the pass from Kate.

$-2x+32 = -2x^2 + 18x$
$+2x - 32 \quad + 2x - 32$
$0 = -2x^2 + 20x - 32$
$\frac{0}{-2} = \frac{-2x^2}{-2} + \frac{20x}{-2} - \frac{32}{-2}$
$0 = x^2 - 10x + 16$
$= (x-8)(x-2)$
$x = 8 \quad x = 2$

$x = 8$: $y = -2(8)+32 = -16+32 = +16$ → $(8, +16)$

$x = 2$: $y = -2(2)+32 = -4+32 = 28$ → $(2, 28)$

a: -2



$0 = -2x^2 + 18x$
$\frac{0}{-2x} = \frac{-2x^2}{-2x} + \frac{18x}{-2x}$
$-2x(x-9)$
$x = 0, \; x = 9$

Solve each system Algebraically. no calculator

2) $y = 8x - 24$
$y = 8$

$8 = 8x - 24$
$+24 \quad +24$
$\frac{32}{8} = \frac{8x}{8}$
$4 = x$

(4, 8)

3) $(y-3) = x$
$-7x + y - 3 = 0$

$-7(y-3) + y - 3 = 0$
$-7y + 21 + y - 3 = 0$
$-6y + 18 = 0$
$-18 \quad -18$
$\frac{-6y}{-6} = \frac{-18}{-6}$
$y = 3$

$y = 3$
$3 - 3 = x$
$0 = x$

(0, 3)

4) $y = -4x - 2$
$8x + 2y = 0$

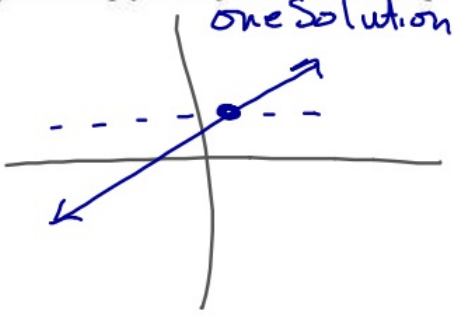
$8x + 2(-4x - 2) = 0$
$8x + -8x - 4 = 0$
$0 - 4 = 0$
$-4 = 0$

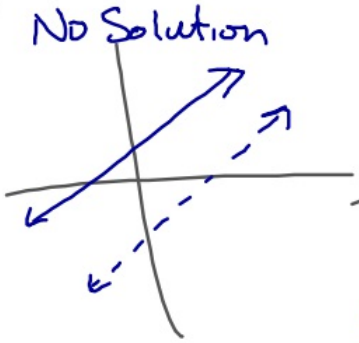
No Solution

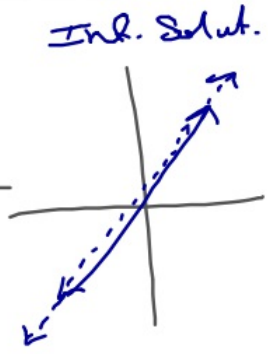
5) $y = x - 2$
$-3x + 3y = -6$

Describe how the solution to each system of equations above would have been represented on a graph. To help you may want to draw a quick sketch.

6)







Solve each system of equations Algebraically, no calculator. Then draw a quick sketch of what the graphical representation would look like. (hint: not all of these quadratics are in one of our forms, that is ok!!!)

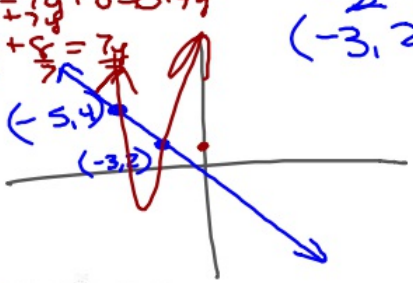
7) $x^2 + x - 7y + 8 = 0$
$(y) = (-x - 1)$

$x^2 + x - 7(-x-1) + 8 = 0$
$x^2 + x + 7x + 7 + 8 = 0$
$x^2 + 8x + 15 = 0$
$(x+5)(x+3)$
$-5 \quad -3$

$x = -5$
$y = -(-5) - 1$
$y = 5 - 1$
$= 4$
$(-5, 4)$

$x = -3$
$y = -(-3) - 1$
$= 3 - 1$
$= 2$
$(-3, 2)$

$x^2 + x - 7y + 8 = 0 + 7y$
$x^2 + x + 8 = 7y$



8) $2x^2 - 2x + 1 - y = 0$
$x + y = 1$

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

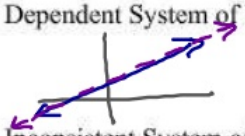
$2(x-1) - 2 = x^2 + x + 4$
$2x - 2 - 2 = x^2 + x + 4$
$2x - 4 = x^2 + x + 4$
$-2x + 4 \qquad -2x + 4$
$0 = x^2 - x + 8$

10) After writing the vocab, go back and classify all above systems as independent, dependent, and inconsistent.

Independent System of Equations: A finite number of solutions.

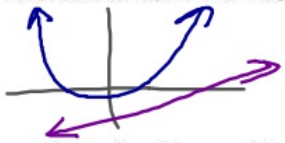
Ex Sol: $(1,3)$, Ex Sol: $(2,5)$ & $(-6,3)$

Dependent System of Equations: An Infinite number of Solution.



Ex: $y=3x+2$, $2y=6x+4$

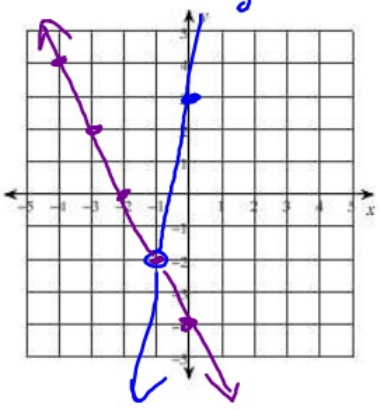
Inconsistent System of Equations: No Solutions



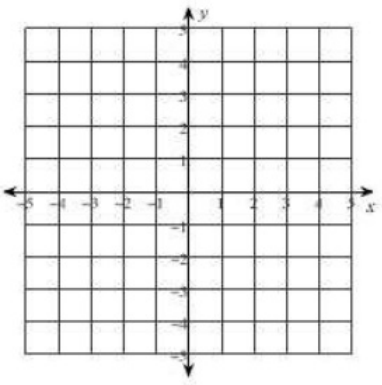
Solve each system by graphing. Calculator allowed for graphical solving, but make a sketch of the graph used. Also classify the system of equations as either independent, dependent, or inconsistent.

11) $2x = -4 - y$
$5x = -3 + y$

$y=-2x-4$
$y=5x+3$

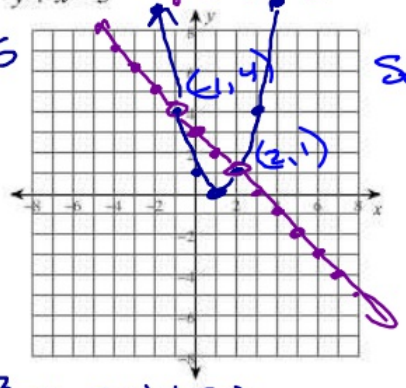


12) $-\frac{3}{4}x = -y + 2$
$8 - 4y = -3x$



Solve each system of equations graphically, sketch each graph, solve the system and then classify the system.

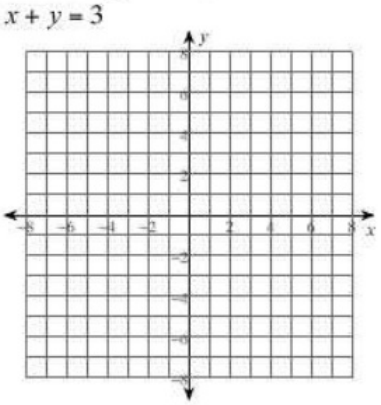
13) $x^2 - y - 2x + 1 = 0$
$y + x = 3$



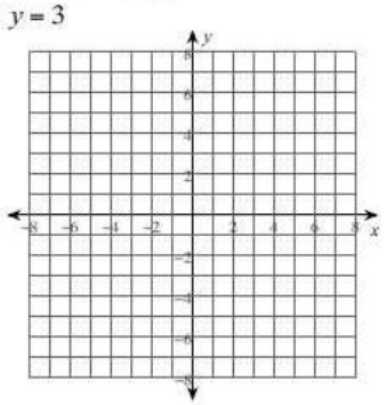
Sol. (-1, 4) & (2, 1)

$x^2 - y - 2x + 1 = 0$
$x^2 - 2x + 1 = y$
$x^2 - 2x + 1 = 0$
$(x-1)(x-1)$
$1 \quad 1$

14) $2x^2 - x + y + 4 = 0$
$x + y = 3$



15) $x^2 - 6x + 8 = y$
$y = 3$



16) $y = 2x^2 + 12x + 20$
$y = -2x - 4$

18 −36 +20
$2(-3)^2 + 12(-3) + 20$

$V\left(\frac{-b}{2a}, \text{min/max}\right)$

$AOS = \frac{-b}{2a} = \frac{-12}{2(2)} = \frac{-12}{4} = -3$

$V(-3, 2)$