



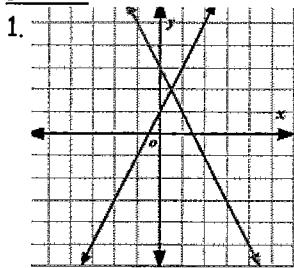
Boot Camp Part 1: System of Equation: Introduction

What are systems of equations? A series of 2 or more equations that describe the same situation.

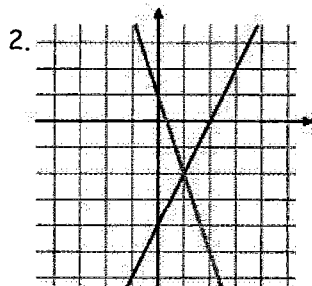
What are the three acceptable answers and what situations need to occur in order for them to happen?

- a. one solution: an ordered pair
- b. No solution: lines don't intersect
- c. Infinitely many solutions: lines are the same

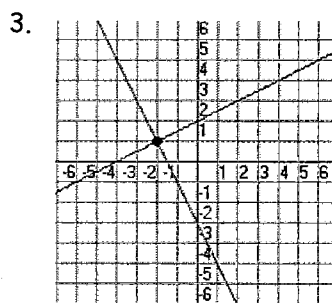
Level 1:



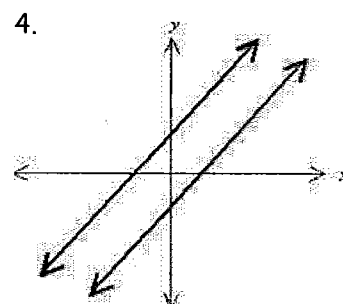
$(0.5, 2)$



$(1, -2)$

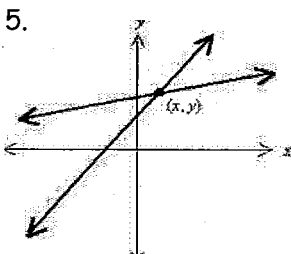


$(-2, 1)$

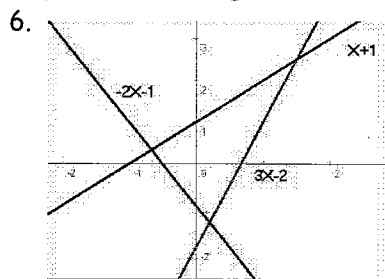


No solution

Level 2: Identify how many solutions are given below.



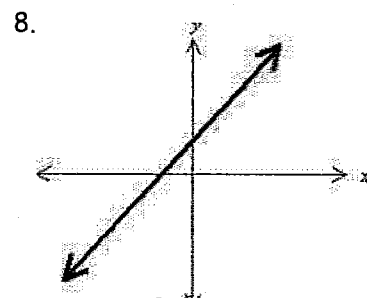
One solution



3 systems; 3 solutions



No solutions



Infinitely many

Boot Camp Part 2: System of Equation: Solving

Substitution:

What does it mean to substitute something in real life? Replace, fill in

In math? replace a variable with an equation or a number.

Sample Problem:

$5x - 3y = 23$
 $y = -2x + 7$

If $y = -2x + 7$ in equation 2, then $y = -2x + 7$ in eq. 1

$5x - 3(-2x + 7) = 23$
 $5x + 6x - 21 = 23$
 $11x = 44$
 $x = 4$

$y = -2(4) + 7$
 $y = -1$

ANS: $(4, -1)$

Level 1: Solve each of the problems below. When you feel comfortable with Level 1, proceed to Level 2.

1) $y = x + 4$
 $x + y = 2$

$$x + (x + 4) = 2 \quad y = (-1) + 4$$

$$2x = -2 \quad y = 3$$

$$x = -1$$

(-1, 3)

2) $y = 3x - 4$
 $y = -2x + 6$

$$3x - 4 = -2x + 6$$

$$5x = 10$$

$$x = 2$$

$$y = 3(2) - 4$$

$$y = 2$$

(2, 2)

3) $y = -7$
 $3x - 5y = 17$

$$3x - 5(-7) = 17$$

$$3x + 35 = 17$$

$$3x = -18$$

$$x = -6$$

(-6, -7)

Level 2: These are considered challenge problems because they are not written in "substitution form".

1) $x - 7y = 11 \rightarrow x = 7y + 11$
 $5x + 4y = -23$

$$5(7y + 11) + 4y = -23$$

$$35y + 55 + 4y = -23$$

$$39y = -78$$

$$y = -2$$

(-3, -2)

2) $-6x - y = 27 \quad y = -6x - 27$
 $3x + 8y = 9$

$$3x + 8(-6x - 27) = 9$$

$$-45x - 216 = 9$$

$$-45x = 225$$

$$x = -5$$

(-5, 3)

3) $x + 3y = 24 \quad x = -3y + 24$
 $3x + 5y = 30$

Elimination:

What does it mean to eliminate something in real life? Get rid of *_____* In math? Adding two equations together in order to get rid of a variable

Sample Problem: $5x - 3y = 23$
 $y + 2x = 7$

$$5x - 3y = 23$$

$$+ 6x + 3y = 21$$

$$11x = 44$$

$$x = 4$$

$$y + 2(4) = 7$$

$$y = -1$$

(4, -1)

Level 1: Solve each of the problems below. When you feel comfortable with Level 1, proceed to Level 2.

1) $4x - 3y = -22$
 $2x + 3y = 16$

$$6x = -6$$

$$x = -1$$

(-1, 6)

$$4(-1) - 3y = -22$$

$$-3y = -18$$

$$y = 6$$

2) $6x - y = 27 \cdot -5$
 $4x - 5y = -12$

$$30x + 5y = 135$$

$$+ 4x - 5y = -12$$

$$34x = 123$$

3) $6x - 4y = 30 \cdot -2$
 $12x + 5y = -18$

$$6x - 4(-6) = 30$$

$$6x = 6$$

$$x = 1$$

(1, -6)

$-12x + 8y = -60$
 $12x + 5y = -18$

$$13y = -78$$

$$y = -6$$

Level 2: These are considered challenge problems because they are not written in "elimination form".

1) $y = -3x + 4$
 $y = 3x - 2$

$$3x + y = 4$$

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

$$2y = 2$$

$$y = 1$$

(1, 1)

2) $-4y - 11x = 36$
 $20 = -10x - 10y$

$$(-11x - 4y = 36) \cdot 5$$

$$(-10x - 10y = 20) \cdot 2$$

$$-55x - 20y = 180$$

$$+ 20x + 20y = -40$$

$$-35x = 140$$

$$x = -4$$

(-4, 2)

$-4y - 11(-4) = 36$
 $-4y = -8$
 $y = 2$

3) $-16y = 22 + 6x$
 $-11y - 4x = 15$

$$-12x - 33y = 45$$

$$+ 12x + 32y = -44$$

$$-y = 1$$

$$y = -1$$

(19/3, 1)

$(-4x - 11y = 15) \cdot 3$
 $(-6x - 16y = 22) \cdot -2$

$$-16(1) = 22 + 6x$$

$$6x = -38$$

$$x = \frac{-38}{6} = -\frac{19}{3}$$