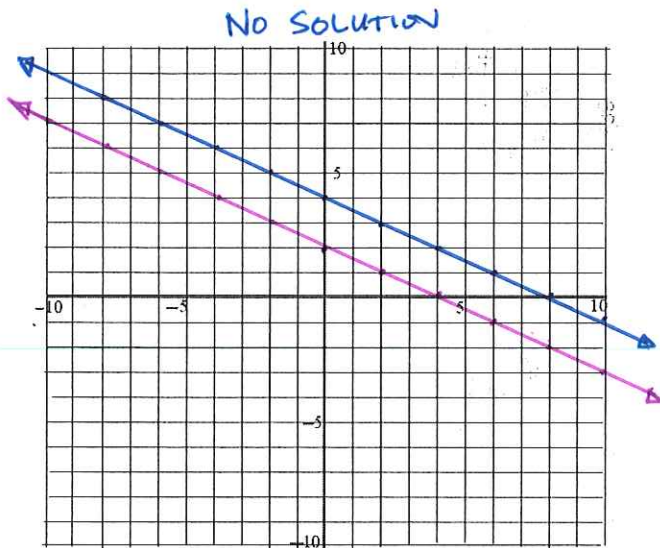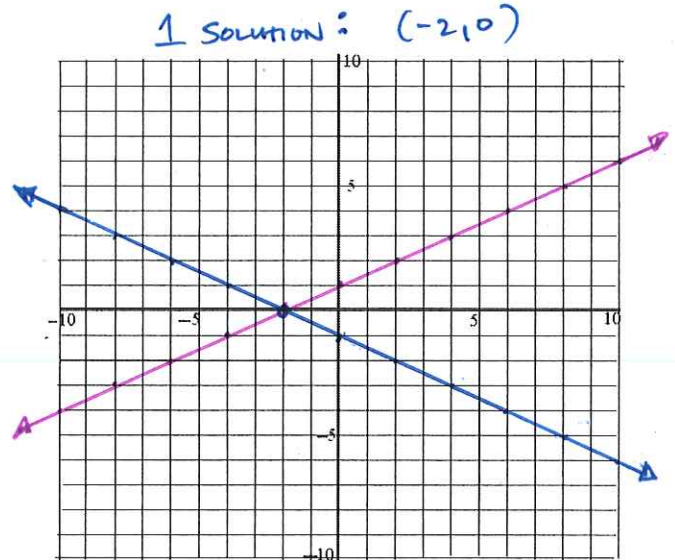**Solve the following system of equations by GRAPHING.**

1.) $3x + 6y - 12 = 0 \rightarrow y = -\frac{1}{2}x + 2$
    $x + 2y = 8 \rightarrow y = -\frac{1}{2}x + 4$

NO SOLUTION

2.) $-x - 2 = -2y \rightarrow y = \frac{1}{2}x + 1$
    $-2x - 4y - 4 = 0 \rightarrow y = -\frac{1}{2}x - 1$

1 SOLUTION: $(-2, 0)$

Solve the following system of equations algebraically (Substitution / Elimination).

3.) $3x + 7y = 15$ (5) $\quad 15x + 35y = 75$
    $5x + 2y = -4$ (-3) $\quad -15x - 6y = 12$

$$29y = 87$$
$$\boxed{y = 3}$$

$(-2, 3)$

PLUG BACK INTO $3x + 7y = 15$
$3x + 7(3) = 15$
$3x + 21 = 15$
$3x = -6$
$\boxed{x = -2}$

4.) $2m + 3n = 12$
    $5m - n = 13 \rightarrow n = 5m - 13$

$2m + 3n = 12$
$2m + 3(5m - 13) = 12$
$2m + 15m - 39 = 12$
$17m = 51$
$\boxed{m = 3}$

$(3, 2)$

PLUG BACK INTO $n = 5m - 13$
$n = 5(3) - 13$
$n = 15 - 13$
$\boxed{n = 2}$

5.) $2m = -4n - 4 \rightarrow m = -2n - 2$
    $3m + 5n = -3$

$3m + 5n = -3$
$3(-2n - 2) + 5n = -3$
$-6n - 6 + 5n = -3$
$-n - 6 = -3$
$-n = 3$
$\boxed{n = -3}$

$(4, -3)$

PLUG BACK INTO
$m = -2n - 2$
$m = -2(-3) - 2$
$m = +6 - 2$
$\boxed{m = 4}$

6.) $2x - 3y = -1$ (3) $\quad 6x - 9y = -3$
    $3x - 4y = 8$ (-2) $\quad -6x + 8y = -16$

$$-y = -19$$
$$\boxed{y = 19}$$

$(28, 19)$

PLUG BACK INTO $2x - 3y = -1$
$2x - 3(19) = -1$
$2x - 57 = -1$
$2x = 56$
$\boxed{x = 28}$

Define variables, Write a System of Equations, and Solve.

7.) After visiting Gobert's Farm in Hampshire this past weekend, Mr. Bruell, Mr. Lee, and Mr. Falinski are looking to purchase materials from the math budget for their own amazing pumpkin catapult. There are two major components that the pumpkin catapult needs, the fulcrum and the frame. Mr. Lee visited "Ho Lee Lumber" to purchase 4 fulcrums and 3 frames. Mr. Lee spent $900 on his supplies. Mr. Falinski visited "Ace Hardware" to purchase 5 fulcrums and 6 frames and his total was $1446. Mr. Bruell wants to make sure the totals are legit; help Mr. Bruell figure out how much each fulcrum and frame cost. (If necessary, round your answers to the nearest hundredth.)

LET X = $ OF A FULCRUM
Y = $ OF A FRAME

MR. LEE : $4X + 3Y = 900$ (-2)
MR. FALINSKI : $5X + 6Y = 1446$

$$-8X - 6Y = -1800$$
$$5X + 6Y = 1446$$
$$-3X = -354$$
$$\boxed{X = 118}$$

PLUG BACK INTO $4X + 3Y = 900$
$$4(118) + 3Y = 900$$
$$472 + 3Y = 900$$
$$3Y = 428$$
$$\boxed{Y = 142.67}$$

8.) Suppose there are two pumpkin farms down the street from your house, Abby-O's Pumpkin Farm and Daisy-O's Pumpkin Farm. Abby-O's charges a $10 entrance fee and all rides are $2 each. Daisy-O's charges a $19 entrance fee and all rides are $0.50 each.

a.) Write a system of equations to represent the cost (C) pending the amount of rides purchased (R).

Abby-O's Pumpkin Farm: $C = 2R + 10$

Daisy-O's Pumpkin Farm: $C = 0.50R + 19$

b.) After how many rides would both pumpkin farms cost the same?

$$2R + 10 = 0.50R + 19$$
$$1.5R = 9$$
$$\boxed{R = 6}$$

c.) If Willy was planning to visit the pumpkin farm, but was not going to do more than 15 rides; which pumpkin farm should he visit? Explain your reasoning?

$\boxed{R = 15}$

ABBY-O'S PUMPKIN FARM
$$C = 2R + 10$$
$$C = 2(15) + 10$$
$$C = 30 + 10$$
$$C = 40$$

DAISY-O'S PUMPKIN FARM
$$C = 0.50R + 19$$
$$C = 0.50(15) + 19$$
$$C = 7.5 + 19$$
$$\boxed{C = 26.5}$$