

Name: Key

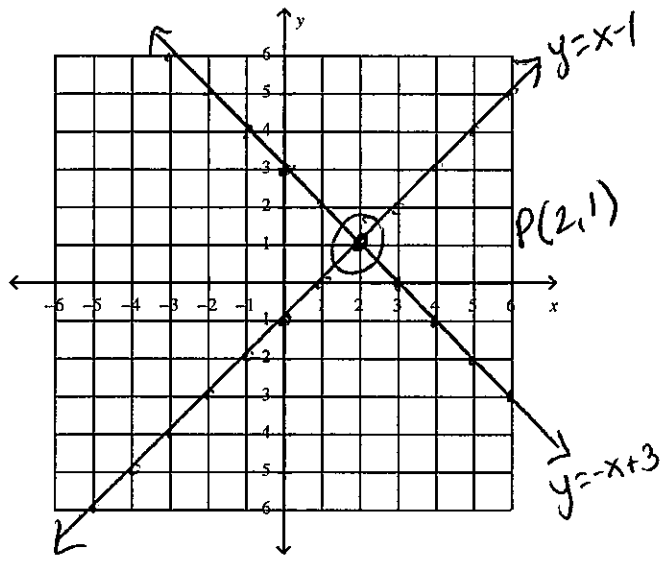
Class: _____

M8-U5: HW #3 – Solving Systems Algebraically – set them equal

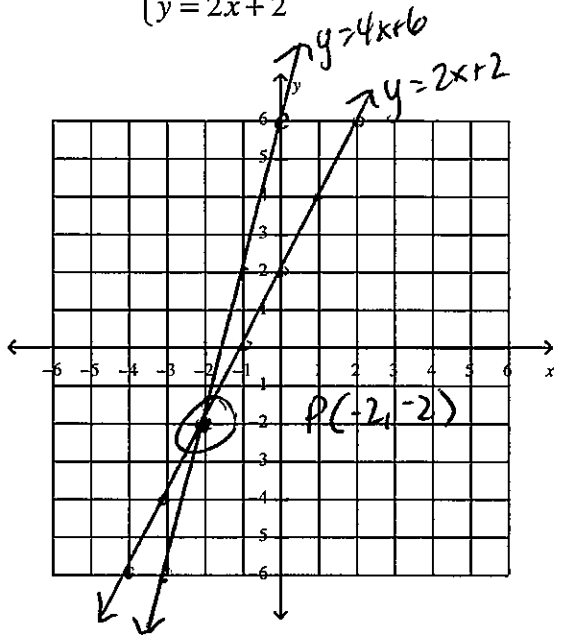
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Graph the following system of equations, find the solution.

1. $\begin{cases} y = x - 1 \\ y = -x + 3 \end{cases}$



2. $\begin{cases} y = 4x + 6 \\ y = 2x + 2 \end{cases}$



Confirm the same answers algebraically.

1. $\begin{cases} y = x - 1 \\ y = -x + 3 \end{cases}$

$$\begin{array}{r} x - 1 = -x + 3 \\ +x + 1 \quad +x + 1 \\ \hline 2x = 4 \\ \frac{2x}{2} = \frac{4}{2} \\ \boxed{x = 2} \end{array}$$

$y = (2) - 1$
 $y = 1$

ck $y = -(2) + 3$
 $= 1 \checkmark$

$\boxed{P(2, 1)}$

2. $\begin{cases} y = 4x + 6 \\ y = 2x + 2 \end{cases}$

$$\begin{array}{r} 4x + 6 = 2x + 2 \\ -2x - 6 \quad -2x - 6 \\ \hline +2x = -4 \\ \frac{+2x}{2} = \frac{-4}{2} \\ \boxed{x = -2} \end{array}$$

$y = 4(-2) + 6$
 $= -8 + 6$
 $y = -2$

ck $y = 2(-2) + 2$
 $= -4 + 2$
 $= -2 \checkmark$

$\boxed{P(-2, -2)}$

Solve the following systems algebraically. Hint: set them equal and solve for x.

$$3. \begin{cases} y = -5x + 8 \\ y = -2x - 7 \end{cases}$$

$$\begin{array}{r} -5x + 8 = -2x - 7 \\ +5x \quad +7 \quad +5x \quad +7 \\ \hline \end{array}$$

$$\frac{15}{3} = \frac{3x}{3}$$

$$\boxed{5 = x}$$

$$\begin{aligned} y &= -5(5) + 8 \\ &= -25 + 8 \\ &= -17 \end{aligned}$$

$$\begin{aligned} \text{or } y &= -2(5) - 7 \\ &= -10 - 7 \\ &= -17 \checkmark \end{aligned}$$

$$\boxed{P(5, -17)}$$

$$4. \begin{cases} y = 22x + 4 \\ y = 14x + 28 \end{cases}$$

$$\begin{array}{r} 22x + 4 = 14x + 28 \\ -14x \quad -4 \quad -14x \quad -4 \\ \hline \end{array}$$

$$\frac{8x}{8} = \frac{24}{8}$$

$$\boxed{x = 3}$$

$$\begin{aligned} y &= 22(3) + 4 \\ &= 66 + 4 \\ y &= 70 \end{aligned}$$

$$\begin{aligned} \text{or } y &= 14(3) + 28 \\ &= 42 + 28 \\ &= 70 \checkmark \end{aligned}$$

$$\boxed{P(3, 70)}$$

5. Suppose a video store charges nonmembers \$4 to rent each video. A store membership costs \$21 and members pay only \$2.50 to rent each video. For what number of videos is the cost the same?

Let: $C = \text{cost in dollars} = \56
 $V = \text{\# of videos} = 14$

$$\begin{cases} C = 4V \\ C = 21 + 2.50V \end{cases}$$

$$C = 4(14) = \$56$$

$$C = 21 + 2.50(14) = \$56 \checkmark$$

$$\begin{array}{r} 4V = 21 + 2.50V \\ -2.50V \quad -2.50V \\ \hline \end{array}$$

$$\frac{1.50V}{1.50} = \frac{21}{1.50}$$

$$V = 14$$

6. Suppose your club is selling candles to raise money. It costs \$100 to rent a booth from which to sell the candles. If the candles cost your club \$1 each and are sold for \$5 each, how many candles must be sold to equal your expenses?

Let: $E = \text{expenses}$ in dollars = \$125
 $P = \text{profits}$ in dollars = \$125

$$C = \text{\# of candles} = 25$$

$$\begin{cases} E = 100 + 1C \\ E = 5C \end{cases}$$

$$\begin{array}{r} 100 + 1C = 5C \\ -1C \quad -1C \\ \hline \end{array}$$

$$\frac{100}{4} = \frac{4C}{4}$$

$$\boxed{25 = C}$$

$$\begin{aligned} E &= 100 + 1(25) \\ &= \$125 \end{aligned}$$

$$\begin{aligned} E &= 5(25) \\ &= \$125 \end{aligned}$$

Spiral:

7. Jane's cell phone plan is \$40 per month plus \$0.15 per minute for each minute over 200 minutes of call time. If Jane's cell phone bill is \$58.00, for how many extra calling minutes was she billed?

Let: $x = \# \text{ of extra minutes} = 120$

$$\begin{array}{r} 40 + .15x = 58 \\ -40 \qquad -40 \\ \hline .15x = 18 \\ \frac{.15}{.15} \quad \frac{18}{.15} \\ x = 120 \end{array}$$

Evaluate the following expressions:

8. ab^3 , where $a = \frac{1}{4}$ and $b = -2$

$$\begin{aligned} & \frac{1}{4}(-2)^3 \\ & \frac{1}{4}(-8) = -2 \end{aligned}$$

9. $(2^4)^3$

$$\begin{aligned} & (2 \cdot 2 \cdot 2 \cdot 2)^3 \\ & \quad \quad \quad \vee \quad \quad \quad \vee \\ & \quad \quad \quad 4 \quad \quad \quad 4 \\ & (16)^3 = 16 \cdot 16 \cdot 16 = 4096 \end{aligned}$$

10. **Multiple Choice:**

Which is a table of values for $y = x - 6$?

a.

x	y
-5	1
-8	-14
-7	-13

b.

x	y
-5	-11
-8	-2
-7	-13

c.

x	y
-5	-11
-8	-14
-7	-13

d.

x	y
-5	1
-8	-2
-7	-1

$$\begin{aligned} y &= (-5) - 6 \\ &= -11 \end{aligned}$$

$$\begin{aligned} y &= (-8) - 6 \\ &= -14 \end{aligned}$$

