

Name: Key

Class: _____

M8-U5: HW #6 Solving Systems by Elimination (Day 2)

Date: _____

Solve by elimination. Show your work.

$$1. \begin{cases} 4(6x+3y=27) \\ 6(-4x+7y=27) \end{cases} \rightarrow \begin{array}{r} 24x+12y=108 \\ -24x+42y=162 \\ \hline 54y=270 \\ \frac{54y}{54}=\frac{270}{54} \end{array}$$

$P(2,5)$

$$6x+3(5)=27$$

$$6x+15=27$$

$$\frac{-15 \quad -15}{6x=12}$$

$$\frac{6x}{6}=\frac{12}{6}$$

$$x=2$$

$$y=5$$

ck

$$-4(2)+7(5) \stackrel{?}{=} 27$$

$$-8+35 \stackrel{?}{=} 27$$

$$27=27 \checkmark$$

$$2. \begin{cases} 2(4x+5y=3) \\ 5(3x-2y=8) \end{cases} \rightarrow \begin{array}{r} 8x+10y=6 \\ 15x-10y=40 \\ \hline 23x=46 \\ \frac{23x}{23}=\frac{46}{23} \end{array}$$

$P(2,-1)$

$$x=2$$

$$4(2)+5y=3$$

$$8+5y=3$$

$$\frac{-8 \quad -8}{5y=-5}$$

$$5y=-5$$

$$y=-1$$

ck

$$3(2)-2(-1) \stackrel{?}{=} 8$$

$$6+2 \stackrel{?}{=} 8$$

$$8=8 \checkmark$$

$$3. \begin{cases} 3(4x-3y=11) \\ -4(3x-5y=-11) \end{cases} \rightarrow \begin{array}{r} 12x-9y=33 \\ -12x+20y=44 \\ \hline 11y=77 \\ \frac{11y}{11}=\frac{77}{11} \end{array}$$

$$y=7$$

$$4x-3(7)=11$$

$$4x-21=11$$

$$\frac{+21 \quad +21}{4x=32}$$

$$\frac{4x}{4}=\frac{32}{4}$$

$$x=8$$

$P(8,7)$

ck

$$3(8)-5(7) \stackrel{?}{=} -11$$

$$24-35 \stackrel{?}{=} -11$$

$$-11=-11 \checkmark$$

$$4. \begin{cases} 10(5x+8y=40) \\ 8(3x-10y=-13) \end{cases} \rightarrow \begin{array}{r} 50x+80y=400 \\ 24x-80y=-104 \\ \hline 74x=296 \\ \frac{74x}{74}=\frac{296}{74} \end{array}$$

$$x=4$$

$$5(4)+8y=40$$

$$20+8y=40$$

$$\frac{-20 \quad -20}{8y=20}$$

$$\frac{8y}{8}=\frac{20}{8}$$

$$y=5/2$$

$P(4, 5/2)$

ck

$$3(4)-10(5/2) \stackrel{?}{=} -13$$

$$12-25 \stackrel{?}{=} -13$$

$$-13=-13 \checkmark$$

Use a system of equations to model each situation. Solve by any method.

5. The sum of two numbers is 30. The sum of the greater number and three times the lesser number is 54. Find the numbers.

let: $x = 1^{\text{st}} \# = 78$
 $y = 2^{\text{nd}} \# = 12$

$$\begin{cases} x + y = 30 \\ x + 3y = 54 \end{cases} \rightarrow \begin{array}{r} x + 3y = 54 \\ -x - y = -30 \\ \hline 2y = 24 \\ \frac{2y}{2} = \frac{24}{2} \\ \hline \boxed{y = 12} \end{array}$$

$$\begin{array}{r} x + (2) = 30 \\ -12 \quad -12 \\ \hline \boxed{x = 78} \end{array}$$

ck
 $78 + 3(12) = 54$
 $18 + 36 = 54$
 $54 = 54 \checkmark$

6. Shopping at Savers Mart, Lisa buys her children four shirts and three pairs of pants for \$85.50. She returns the next day and buys three shirts and five pairs of pants for \$115.00. What is the price of each shirt and each pair of pants?

let: $x = \text{cost of shirts} = \7.50
 $y = \text{cost of pants} = \18.50

ck
 $3(7.50) + 5(18.50) = 115$
 $22.50 + 92.50 = 115$
 $115 = 115 \checkmark$

$$\begin{cases} 4x + 3y = 85.50 \\ 3x + 5y = 115.00 \end{cases} \rightarrow \begin{array}{r} -12x - 9y = -256.50 \\ 12x + 20y = 460.00 \\ \hline 11y = 203.50 \\ \frac{11y}{11} = \frac{203.50}{11} \\ \hline \boxed{y = 18.50} \end{array}$$

$$\begin{array}{r} 4x + 3(18.50) = 85.50 \\ 4x + 55.50 = 85.50 \\ -55.50 \quad -55.50 \\ \hline 4x = 30 \\ \frac{4x}{4} = \frac{30}{4} \\ \hline \boxed{x = 7.50} \end{array}$$

7. An amusement park charges admission plus a fee for each ride. Admission plus two rides costs \$10. Admission plus five rides cost \$16. What is the charge for admission and the cost of a ride?

let: $a = \text{cost of admission} = \6
 $r = \text{cost of rides} = \2

$$\begin{cases} a + 2r = 10 \\ a + 5r = 16 \end{cases} \rightarrow \begin{array}{r} a + 5r = 16 \\ -a - 2r = -10 \\ \hline 3r = 6 \\ \frac{3r}{3} = \frac{6}{3} \\ \hline \boxed{r = 2} \end{array}$$

$$\begin{array}{r} a + 2(2) = 10 \\ a + 4 = 10 \\ -4 \quad -4 \\ \hline \boxed{a = 6} \end{array}$$

ck
 $(6) + 5(2) = 16$
 $6 + 10 = 16$
 $16 = 16 \checkmark$