

Warm-Up:

Solve the following systems of equations.

1) $y = 5x$

$3x + 4y = 46$

$3x + 4(5x) = 46$

$3x + 20x = 46$

$\frac{23x}{23} = \frac{46}{23} \quad x = 2$

$y = 5(2)$
 $y = 10$

$(2, 10)$

2) $5x - 3y = 18$

$2x + 3y = 24$

$\frac{7x}{7} = \frac{42}{7}$

$x = 6$

$5(6) - 3y = 18$
 $30 - 3y = 18$
 $-30 \quad -30$

$(6, 4)$

$\frac{-3y}{-3} = \frac{-12}{-3} \quad y = 4$

Pg 269 #24

Pg 276 #18, 10

29) $b + g = 326.6$

$b - g = 295.4$

$\frac{2b}{2} = \frac{622}{2}$

$b = 311 \text{ ft}$

$\frac{-311g - 311}{-311} = \frac{-326.6 - 311}{-311}$
 $g = 15.6 \text{ ft}$

Pg 276

10) $4x - 3y = 12$

$-1(x + 2y = 14)$

$x + 2(4) = 14$

$x + 8 = 14$

$-8 \quad -8$

$x = 6$

$4x - 3y = 12$

$-4x - 8y = -56$

$\frac{-11y}{-11} = \frac{-44}{-11}$

$y = 4$

$(6, 4)$

18) $x = 2\text{-pt FGs}$

$y = 3\text{-pt FGs}$

$2x + 3y + 305 = 1342$

$2x + 3y = 1037$

$-2(x + y = 517)$

$x + 3 = 517$

$-x = 514$

$2x + 3y = 1037$

$-2x - 2y = -1034$

$y = 3$

514 2-pt FGs
3 3-pt FGs

Section 5-5: Applying Systems of Equations

| Method: | When Best to Use: |
|--------------|---|
| Graphing | Only when instructed |
| Substitution | When a variable is alone or has a coefficient of 1. |
| Elimination | When equations are in standard form or no variables have coefficients of one. |

Examples:

1) At a Boy Scout fundraising dinner, Mr. Jones bought 2 adult meals and 3 child meals for \$23. Mrs. Gomez bought 4 adult meals and 2 child meals for \$34.

a) Set up a system of equations to represent this situation.

$$\begin{aligned} \alpha &= \text{adult meals} & \Omega &= \text{child meal} \\ -2(2\alpha + 3\Omega &= 23) \\ 4\alpha + 2\Omega &= 34 \end{aligned}$$

b) Determine the best method to solve the system of equations

Elimination

c) Solve the system.

$$\begin{array}{r} -4\alpha - 6\Omega = -46 \\ 4\alpha + 2\Omega = 34 \\ \hline -4\Omega = -12 \\ \frac{-4\Omega}{-4} = \frac{-12}{-4} \\ \Omega = 3 \end{array} \qquad \begin{array}{r} 2\alpha + 3(3) = 23 \\ 2\alpha + 9 = 23 \\ -9 \quad -9 \\ \hline 2\alpha = 14 \\ \frac{2\alpha}{2} = \frac{14}{2} \\ \alpha = 7 \end{array}$$

\$7 for adult meal
\$3 for child meal

Examples:

2) Ace Car Rental rents a car for \$45/day and \$0.25/mile. Star Car Rental rents a car for \$35/day and \$0.30/mile. How many miles would a car need to be driven before the cost of renting a car at either place is the same?

$C = \text{cost}$ $m = \text{miles}$

$$45 + .25m = C$$
$$35 + .30m = C$$
$$35 + .30m = 45 + .25m$$
$$\begin{array}{r} - .30m \qquad \qquad - .30m \\ \hline 35 = 45 - .05m \\ -45 \quad -45 \\ \hline -10 = -.05m \\ \hline -10 \quad \quad -10 \\ -.05 \quad -.05 \\ \hline 200 = m \\ \text{miles} \end{array}$$

Examples:

3) Laura and Brent paddled a canoe 6 miles upstream in four hours. The return trip took three hours. Find the rate at which Laura and Brent paddled the canoe in still water. $x = \text{paddling}$ $y = \text{current}$

| | Distance | Rate | Time |
|-------------|----------|---------|-------|
| Upstream: | 6mi | $x - y$ | 4 hrs |
| Downstream: | 6mi | $x + y$ | 3 hrs |

$$6 = (x - y)4$$
$$6 = (x + y)3$$
$$3(6 = 4x - 4y)$$
$$4(6 = 3x + 3y)$$
$$18 = 12x - 12y$$
$$24 = 12x + 12y$$
$$\begin{array}{r} 42 = 24x \\ \hline 24 \quad 24 \end{array}$$
$$1.75 = x$$

mph x

Homework: Worksheet 5-5

Ch 5 Test January 5/6