

## Guided Notes: Applications of Systems of Equations

Step 1: Define your variables

Step 2: Set up your systems of equations

Step 3: Solve the system

Step 4: Write your answer in context of the problem based on the variables you set up

EX1. Sue has a collection of quarters and nickels. She has 17 coins whose total value is \$1.85. How many of each type of coin does she have?

$q$  = quarters  
 $n$  = nickels

$$\boxed{n=12}$$

$$q+n=17$$

$$0.25q+0.05n=1.85$$

$$\begin{array}{r} q+12=17 \\ -12 \quad -12 \end{array}$$

$$\boxed{q=5}$$

EX2. A certain movie theater has a capacity of 250 people. A child's ticket costs \$3.00 and an adult movie ticket costs \$4.50. A full house last night made \$1017. How many children and adults attended the movie?

$a = \text{adults}$

$c = \text{children}$

$$\begin{array}{r} a+c=250 \\ -c \qquad -c \\ \hline a=250-c \end{array}$$

$$a=250-72$$

$$a=178$$

$$a+c=250$$

$$4.5a+3c=1017$$

$$4.5(250-c)+3c=1017$$

$$1125-4.5c+3c=1017$$

$$1125-1.5c=1017$$

$$c=72$$

EX3. Jaden took 60 minutes to answer a combination of 20 multiple-choice and extended-response questions. He took 2 minutes to answer each multiple choice question and 6 minutes to answer each extended-response question. How many of each type of question was on the test?

$m$  = multiple-choice

$e$  = extended response

$$m + e = 20$$

$$2m + 6e = 60$$

$$\begin{array}{r} m + e = 20 \\ -e \qquad -e \\ \hline m = 20 - e \end{array}$$

$$m = 20 - 5$$

$$m = 15$$

$$2(20 - e) + 6e = 60$$

$$40 - 2e + 6e = 60$$

$$40 + 4e = 60$$

$$-40$$

$$-40$$

$$4e = 20$$

$$e = 5$$

EX4. The Myers Cell Phone Company charges \$50 per month plus 15 cents per minute while the McNeill Cell Phone Company charges no monthly fee but 25 cents per minute. After how many minutes of phone usage would a monthly phone bill be the same from both companies?

$m = \text{minutes}$

$C = \text{cost}$

$$C = 50 + 0.15m$$

$$C = 0.25m$$

$$\begin{array}{r} 0.25m = 50 + 0.15m \\ -0.15m \quad \quad -0.15m \\ \hline \end{array}$$

$$\frac{0.10m}{0.10} = \frac{50}{0.10}$$

$$m = 500$$

After 500 minutes