Applications of Linear Systems:

Coin Problems

Now that we know how to solve systems of linear equations, we can solve word problems more easily.

Example 1:

A collection of 17 coins consists of nickels and dimes. If the total value of the collection is $\$1.35$, how many nickels and dimes make up the collection?

	# of coins	coin value	total coin value
nickels	$\boldsymbol{x}$	$\$0.05$	
dimes	$\boldsymbol{y}$	$\$0.10$	
total		----------	$\$1.35$

* ---- leave blank, since this value was given, we do not need to fill out the two boxes that are crossed out.

Now that the table is filled out, we obtain two equations:

$$\boldsymbol{x + y =} \_\_\_\_\_$$

$$\_\_\_\_\_ + \_\_\_\_\_ = \$1.35$$

Here we can use any method to solve this system, but first we should **clear the decimals** in the second equation using the LCD.

$$0.05x + 0.10y = 1.35$$

LCD $= 100$

$$100[0.05x + 0.10y] = 100[1.35]$$

$$5x + 10y = 135$$

So our system becomes:

$$\boldsymbol{x + y = 17}$$
$$\boldsymbol{5x + 10y = 135}$$

(Original equations)

Now solve the system.

Since $\boldsymbol{x =}$ _____ and $\boldsymbol{y =}$ _____ that means there are _____ nickels and _____ dimes in the collection.

Example 2:

A stack of 30 bills consists of 1 dollar bills and 5 dollar bills. If the total value is $74, how many 1 dollar bills and how many 5 dollar bills are there?

	# of bills	bill value	total value
One dollar bills			
Five dollar bills			
Total		----------	

Now fill out the chart, write a system of equations then solve.

Applications of Linear Systems:
Coin Problems — Practice Problems

A collection of quarters and dimes has a total value of $3.45. If there are a total of 21 coins, how many quarters and how many dimes make up the collection?

	# of coins	coin value	total coin value
Quarters			
Dimes			
Total		----------	