

Objective for Tuesday 10/29: I can write systems of equations that represent real-world situations

Objective for Wednesday 10/30: I can write and solve systems of equations that represent real-world situations.

**Forms of equations****Slope-intercept form**

- Slope-intercept form is  $y = mx + b$
- In the real world slope,  $m$ , means rate of change and the  $y$ -intercept,  $b$ , means starting point.

**Standard form**

- Standard form is  $ax + by = c$   
 $a$  and  $b$  are circled in red, and  $c$  is circled in blue and labeled "constant" with an arrow.

**Steps to Solve**

- Cover up the question to understand the problem
- Define your variables
- Set up a system of equations no question
- Uncover the question
- Solve keeping the question in mind

**I Do**Example 1

Wendy is starting a catering business and is attempting to figure out who she should be using to transport the food to different locations. She has found two trucking companies that are willing to make sure her food arrives intact. Peter's Pick Up charges \$0.40 per mile and charges a flat fee of \$68. Helen's Haulers charges \$0.65 per mile and charges a flat fee of \$23.

flat fee

a. Define your variables

b. Set up your system of equations

Peter  $y = 68 + .4x$

Helen  $y = 23 + .65x$

c. For what distance would the cost of transporting to the produce be the same for both companies? What is that equal cost? Use mathematics to explain how you determined your answer. Use words, symbols or both in your explanation.

d. Which company charges a lower fee for a 160 mile trip? Use mathematics to justify your answer.

e. Which company will move a greater distance for \$200? Use mathematics to justify your answer.

### We Do

#### Example 2

Jonas needs a cell phone. He has a choice between two companies with the following monthly billing policies. Each company's monthly billing policy has an initial operating fee and charge per minute.

	<del>flat fee</del> Operating Fee	Charge per Minute
Terri's Telephone	29.95	0.14
Carrie's Connection	4.95	0.39

a. Define your variables

$$y = \text{total cost}$$
$$x = \# \text{ of min}$$

b. Set up your system of equations

$$y = 29.95 + .14x$$
$$y = 4.95 + .39x$$

c. At how many minutes is the monthly cost the same? What is the equal monthly cost of the two plans? Use mathematics to explain how you determined your answer. Use words, symbols, or both in your explanation.

d. Which plan costs more 150 minutes of calls each month? Use mathematics to justify your answer.

e. Which plan provides more minutes for \$ 60.00? Use mathematics to justify your answer.

### You Do

#### Example 3

Old McDonald had a farm that had Chickens and Ducks. Everyday Mr. McDonald collects 19 eggs, and he knows that each Duck lays 2 eggs, while each Chicken lays 3 eggs. But each week, every Duck eats 3 pounds of feed, while every chicken eats 4 pounds of feed, for a total of 26 pounds of feed.

a. Define your variables

b. Set up your system of equations

then work on Ex 4  $a+b$

c. How many ducks are there? How many chickens are there? Use mathematics to explain how you determined your answer. Use words, symbols or both in your explanation.

## Independent Practice

### Problem 4

At the local Convenience store William and Sarah are getting snacks for the friends. William buys 3 soft drinks and 2 hot dogs at a cost of \$ 7.70, while Sarah buys 2 soft drinks and 1 hot dog at cost of \$ 4.55.

- a. Define your variables
- b. Set up your system of equations
- c. What is the cost of 1 soft drink? What is the cost of 1 hot dog? Use mathematics to explain how you determined your answer. Use words, symbols or both in your explanation.

### Problem 5

Movies Are Us has two video rental plans. The Regular video rental plan charges \$3.25 for each video rental. The Preferred video rental plan has an \$ 8.75 membership fee and charges \$ 2 for each video rental.

- a. Define your variables.
- b. Write a system of equations to model the above situation.
- c. How many video rentals give the two plans the same cost? What is the equal cost? Use mathematics to explain how you determined your answer. Use words, symbols or both in your explanation.
- d. Which video plan costs more for 18 video rentals? Use mathematics to justify your answer.

Objective for Tuesday 10/29: I can write systems of equations that represent real-world situations

Objective for Wednesday 10/30: I can write and solve systems of equations that represent real-world situations.

**Forms of equations****Slope-intercept form**

- Slope-intercept form is  $y = mx + b$
- In the real world slope,  $m$ , means rate of change and the  $y$ -intercept,  $b$ , means starting value / base

**Standard form**

- Standard form is  $ax + by = c$

**Steps to Solve**

- Cover up the question to understand the problem
- Define your variables
- Set up a system of equations
- Uncover the question
- Solve keeping the question in mind

SET UP

SOLVING

**I Do**Example 1

Wendy is starting a catering business and is attempting to figure out who she should be using to transport the food to different locations. She has found two trucking companies that are willing to make sure her food arrives intact. Company 1 Peter's Pick Up charges \$0.40 per mile and charges a flat fee of \$68. Company 2 Helen's Haulers charges \$0.65 per mile and charges a flat fee of \$23.

- a. Define your variables

$m = \text{number of miles}$

- b. Set up your system of equations

Company 1 (Peter)  
 $.4 \text{ per mile}$   
 $68 \text{ fee}$   
 peter  $\rightarrow t = .4m + 68$

Company 2  
 $.65 \text{ per mile}$   
 $23 \text{ fee}$

$t = \text{total cost } t$

$t = .65m + 23$

- c. For what distance would the cost of transporting to the produce be the same for both companies? What is that equal cost? Use mathematics to explain how you determined your answer. Use words, symbols or both in your explanation.

$y = mx + b$

d. Which company charges a lower fee for a 160 mile trip? Use mathematics to justify your answer.

e. Which company will move a greater distance for \$200? Use mathematics to justify your answer.

### We Do

#### Example 2

Jonas needs a cell phone. He has a choice between two companies with the following monthly billing policies. Each company's monthly billing policy has an initial operating fee and charge per minute.

	Operating Fee	Charge per Minute
Terri's Telephone	29.95	0.14
Carrie's Connection	4.95	0.39

a. Define your variables

$p = \text{total cost}$   
 $m = \# \text{ of min}$

Carrie

4.95 act.

.39 per min

Terri  
 .14 per min  
 29.95 act. fee

b. Set up your system of equations

(Carrie)  $p = 4.95 + .39m$   
 $p = 29.95 + .14m$

c. At how many minutes is the monthly cost the same? What is the equal monthly cost of the two plans? Use mathematics to explain how you determined your answer. Use words, symbols, or both in your explanation.

d. Which plan costs more 150 minutes of calls each month? Use mathematics to justify your answer.

e. Which plan provides more minutes for \$ 60.00? Use mathematics to justify your answer.

### You Do

#### Example 3

Old McDonald had a farm that had Chickens and Ducks. Everyday Mr. McDonald collects 19 eggs, and he knows that each Duck lays 2 eggs, while each Chicken lays 3 eggs. But each week, every Duck eats 3 pounds of feed, while every chicken eats 4 pounds of feed, for a total of 26 pounds of feed.

a. Define your variables

b. Set up your system of equations

c. How many ducks are there? How many chickens are there? Use mathematics to explain how you determined your answer. Use words, symbols or both in your explanation.

## Independent Practice

### Problem 4

At the local Convenience store William and Sarah are getting snacks for the friends. William buys 3 soft drinks and 2 hot dogs at a cost of \$ 7.70, while Sarah buys 2 soft drinks and 1 hot dog at cost of \$ 4.55.

a. Define your variables

$s$  = soft drink  
 $h$  = hot dog

b. Set up your system of equations

William  $\rightarrow 3s + 2h = 7.70$   
Sarah  $\rightarrow 2s + 1h = 4.55$

c. What is the cost of 1 soft drink? What is the cost of 1 hot dog? Use mathematics to explain how you determined your answer. Use words, symbols or both in your explanation.

### Problem 5

Movies Are Us has two video rental plans. The Regular video rental plan charges \$3.25 for each video rental. The Preferred video rental plan has an \$ 8.75 membership fee and charges \$ 2 for each video rental.

a. Define your variables.

regular rent \$3.25  
member: 8.75  
rental \$2

b. Write a system of equations to model the above situation.

$\text{pref} \rightarrow 8.75 + 2v = t$   
 $\text{reg} \rightarrow 3.25v = t$   
 $v = \text{video rental}$   
 $t = \text{total rental}$

c. How many video rentals give the two plans the same cost? What is the equal cost? Use mathematics to explain how you determined your answer. Use words, symbols or both in your explanation.

d. Which video plan costs more for 18 video rentals? Use mathematics to justify your answer.



Objective for Tuesday 10/29: I can write systems of equations that represent real-world situations

Objective for Wednesday 10/30: I can write and solve systems of equations that represent real-world situations.

## Forms of equations

## Slope-intercept form

- (graphing)  $y = mx + b$
- Slope-intercept form is  $y = mx + b$
  - In the real world slope,  $m$ , means rate of change and the  $y$ -intercept,  $b$ , means starting amount/base

## Standard form

- (elimination)
- Standard form is  $ax + by = c$

## Steps to Solve

- 1.) Cover up the question to understand the problem
- 2.) Define your variables
- 3.) Set up a system of equations
- 4.) Uncover the question
- 5.) Solve keeping the question in mind

understand

set-up

solve

## I Do

## Example 1

Wendy is starting a catering business and is attempting to figure out who she should be using to transport the food to different locations. She has found two trucking companies that are willing to make sure her food arrives intact. Peter's Pick Up charges \$0.40 per mile and charges a flat fee of \$68. Helen's Haulers charges \$0.65 per mile and charges a flat fee of \$23.

a. Define your variables

 $m = \text{miles}$  $t = \text{total}$ 

b. Set up your system of equations

Peter:  $t = 68 + .4m$

Helen:  $t = 23 + .65m$

c. For what distance would the cost of transporting to the produce be the same for both companies? What is that equal cost? Use mathematics to explain how you determined your answer. Use words, symbols or both in your explanation.

d. Which company charges a lower fee for a 160 mile trip? Use mathematics to justify your answer.

e. Which company will move a greater distance for \$200? Use mathematics to justify your answer.

### We Do

#### Example 2

Jonas needs a cell phone. He has a choice between two companies with the following monthly billing policies. Each company's monthly billing policy has an initial operating fee and charge per minute.

	Operating Fee	Charge per Minute
Terri's Telephone	29.95	0.14
Carrie's Connection	4.95	0.39

a. Define your variables

Terri  
Fee \$29.95  
.14/min

Carrie  
4.95  
.39/min

$t = \text{total}$   
 $x = \text{how long talk}$

b. Set up your system of equations

total cost = op fee + charges on how long

c. At how many minutes is the monthly cost the same? What is the equal monthly cost of the two companies? Use mathematics to explain how you determined your answer. Use words, symbols, or both in your explanation.

$$T \quad 29.95 + .14x = t$$

$$C \quad 4.95 + .39x = t$$

d. Which plan costs more 150 minutes of calls each month? Use mathematics to justify your answer.

e. Which plan provides more minutes for \$ 60.00? Use mathematics to justify your answer.

### You Do

#### Example 3

Old McDonald had a farm that had Chickens and Ducks. Everyday Mr. McDonald collects 19 eggs, and he knows that each Duck lays 2 eggs, while each Chicken lays 3 eggs. But each week, every Duck eats 3 pounds of feed, while every chicken eats 4 pounds of feed, for a total of 26 pounds of feed.

a. Define your variables

b. Set up your system of equations

c. How many ducks are there? How many chickens are there? Use mathematics to explain how you determined your answer. Use words, symbols or both in your explanation.

## Independent Practice

### Problem 4

At the local Convenience store William and Sarah are getting snacks for the friends. William buys 3 soft drinks and 2 hot dogs at a cost of \$ 7.70, while Sarah buys 2 soft drinks and 1 hot dog at cost of \$ 4.55.

- a. Define your variables
- b. Set up your system of equations
- c. What is the cost of 1 soft drink? What is the cost of 1 hot dog? Use mathematics to explain how you determined your answer. Use words, symbols or both in your explanation.

### Problem 5

Movies Are Us has two video rental plans. The Regular video rental plan charges \$3.25 for each video rental. The Preferred video rental plan has an \$ 8.75 membership fee and charges \$ 2 for each video rental.

- a. Define your variables.
- b. Write a system of equations to model the above situation.
- c. How many video rentals give the two plans the same cost? What is the equal cost? Use mathematics to explain how you determined your answer. Use words, symbols or both in your explanation.
- d. Which video plan costs more for 18 video rentals? Use mathematics to justify your answer.