Math 1 **3.8 Linear Programming (Day 1)** Unit 3 Day 8

*SWBAT write and graph linear inequalities to model situations.*

**Words to Recognize**

* ***No More Than:*** *\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*
* ***No Less Than:*** *\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*
* **At Least:** *\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*
* **At Most: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Steps to Solving:**

*Step 1:* Read the problem and underline the question

*Step 2:* Define the variables (found in the question)

*Step 3:* Write an inequality (pay attention to the key words)

*Step 4:* Use the **cover-up** method to graph the inequality (if in standard form)

*Step 4:* Shade the inequality

*Step 5:* Answer the question

**Situation #1: PARTY NUTS.**

Zark is buying peanuts and cashews for a party. He can spend no more than $24. Peanuts cost $2 per pound and cashews cost $3 per pound.

Let x = number of pounds of peanuts

Let y = number of pounds of cashews

Inequality: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

X-intercept: \_\_\_\_\_\_\_\_\_\_\_ Y-intercept: \_\_\_\_\_\_\_\_\_\_\_

1. Which of the following is a solution of the inequality:
   1. (2, 8)
   2. (4, 6)
   3. (8, 2)
2. What is the greatest number of pounds of peanuts that Zark can buy?
3. If x = 6 lb, what are all possible values of y?

**Situation #2: RUB-A-DUB-DUB.**

Kara is filling her bathtub. The cold water flows at a rate of 4 gal/min. The hot water flows at a rate of 3 gal/min. Kara wants no more than 60 gal of water in the tub.

Let x = time that cold water is turned on

Let y = time that hot water is turned on

Inequality: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

X-intercept: \_\_\_\_\_\_\_\_\_\_\_ Y-intercept: \_\_\_\_\_\_\_\_\_\_\_

1. Which of the following is a solution of the inequality:
   1. (5, 16)
   2. (10, 4)
   3. (12, 5)
2. How many minutes will it take to get 60 gal of water if only cold water is turned on?
3. If x = 3 min, what are all possible values of y?

**What Do You Call a New Movie That Is Just Like an Old Movie?**

Write and graph a system of inequalities that models the situation. Circle the number-letter pair for each ordered pair that is a solution. Write the letter in the matching numbered box at the bottom.

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**Situation 1: SOMETHING FISHY.**

The owner of Fred’s Fish Market orders cod and salmon. He wants to buy at least 50 pounds of fish but cannot spend more than $300. Cod is $4 per pound and salmon is $7 per pound.

Let x = pounds of cod

Let y = Pounds of salmon

Inequality #1: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

X-intercept: \_\_\_\_\_\_\_\_\_\_\_ Y-intercept: \_\_\_\_\_\_\_\_\_\_\_

Inequality #2: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

X-intercept: \_\_\_\_\_\_\_\_\_\_\_ Y-intercept: \_\_\_\_\_\_\_\_\_\_\_

Which of the following are solutions?



**Situation #2: FLOWER POWER.**

Mr. Bloom is designing a rectangular flower garden with a fence around it. He can use no more than 80 ft of fencing. He wants the width to be at least 5 ft and the length to be at least 20 ft.

Let x = width of the garden (ft)

Let y = length of the garden (ft)

Inequality #1: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

X-intercept: \_\_\_\_\_\_\_\_\_\_\_ Y-intercept: \_\_\_\_\_\_\_\_\_\_\_

Inequality #2: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Inequality #3: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Which of the following are solutions?



**Situation #3: SPRING FLING.**

Tickets for the Spring Dance cost $3 per person or $5 per couple. To cover expenses, at least $750 worth of tickets must be sold. However, no more than 400 people can fit in the gym where the dance is being held.



Let x = number of $3 tickets sold

Let y = number of $5 tickets sold

Inequality #1: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

X-intercept: \_\_\_\_\_\_\_\_\_\_\_ Y-intercept: \_\_\_\_\_\_\_\_\_\_\_

Inequality #2: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

X-intercept: \_\_\_\_\_\_\_\_\_\_\_ Y-intercept: \_\_\_\_\_\_\_\_\_\_\_

Which of the following are solutions?

