

6.7 Linear Programming (Day 1)

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.

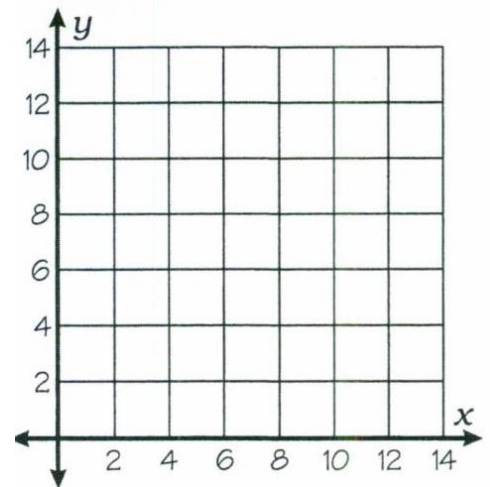
Zark is buying peanuts and cashews for a party. He can spend no more than \$24. Peanuts cost \$2 per pound and cashews cost \$3 per pound.

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:
 a. (2, 8) b. (4, 6) c. (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.

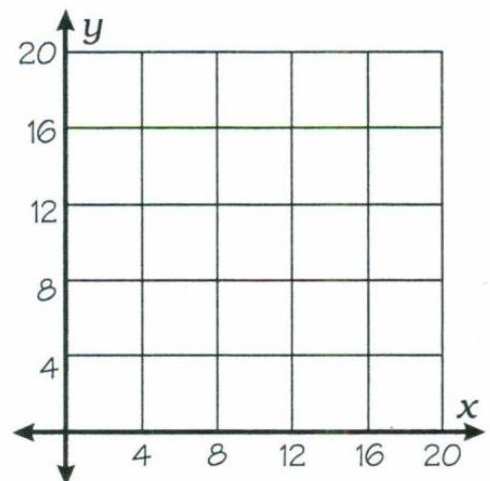
Kara is filling her bathtub. The cold water flows at a rate of 4 gal/min. The hot water flows at a rate of 3 gal/min. Kara wants no more than 60 gal of water in the tub.

Let x = time that cold water is turned on
 Let y = time that hot water is turned on

Inequality: _____

X-intercept: _____ Y-intercept: _____

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



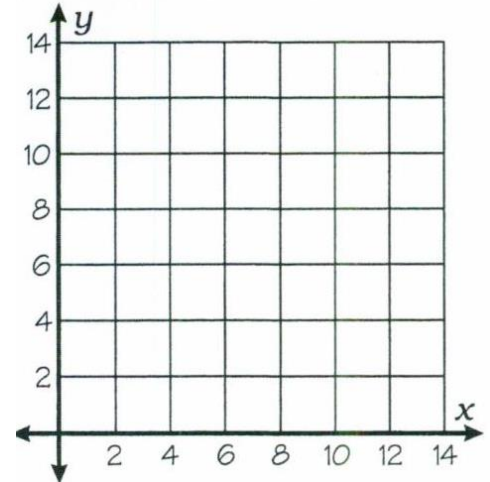
Situation 3: Time Management

You are planning on what to do after school. You can spend at most 6 hours daily playing basketball and doing homework. You want to spend less than 2 hours playing basketball. You must spend at least 1 1/2 hour on homework. What is a graph showing how you can spend your time?

Let x = the number of hours playing basketball.
 Let y = the number of hours doing homework.

Inequalities: _____

X-intercept: _____ Y-intercept: _____



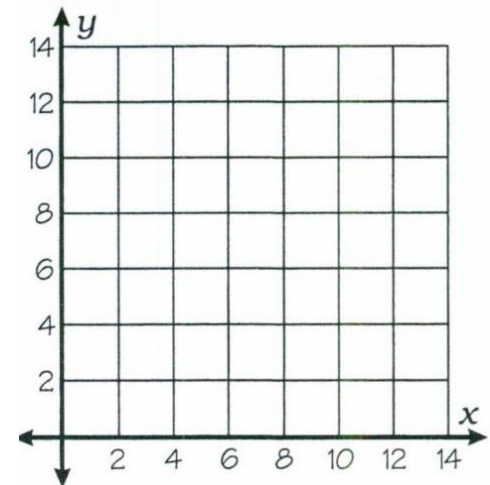
Situation #4 Dog Care

A dog walker earns 15 per hour. She also earns \$12 per hour for babysitting. She wants to earn at least \$300 next week, but can work no more than 30 hours. What is a graph showing how many hours she can work at each job?

Let x = the amount earned walking dogs
 Let y = the amount earned babysitting

Inequalities: _____

X-intercept: _____ Y-intercept: _____



Situation #5: SUMMER JOBS.

Suppose you have a job mowing lawns that pays \$12 per hour. You also have a job at a clothing store that pays \$10 per hour. You need to earn at least \$350 per week, but you can work no more than 35 h per week. You must work a minimum of 10 hr per week at the clothing store. What is a graph showing how many hours per week you can work at each job

Let x =
 Let y =

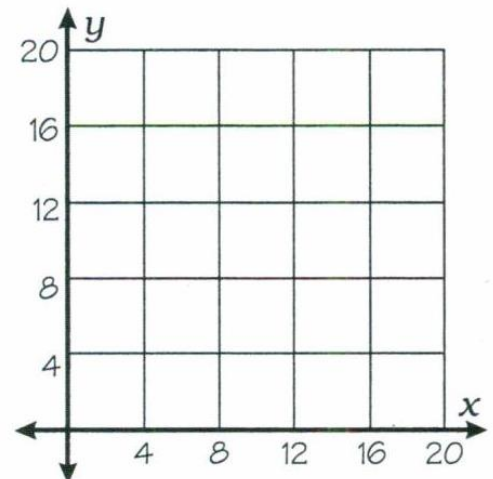
Inequality: _____

X-intercept: _____ Y-intercept: _____

7. Which of the following is a solution of the inequality:
 a. (20, 12) b. (5, 20) c. (20, 40)

8. How many hours can you work at the clothing store if you work 25 hours mowing lawns?

9. If $x = 20$ min, what are all possible values of y ?



Situation #6: ROAD TRIPS.

Two friends agree to split the driving on a road trip from Philadelphia, Pennsylvania, to Denver, Colorado. One friend drives at an average speed of 60 mi/hr. The other friend drives at an average speed of 55 mi/hr. They want to drive at least 500 mi per day. They plan to spend no more than 10 h driving each day. The friend who drives slower wants to drive fewer hours. What is a graph showing how they can split the driving each day?

Let $x =$

Let $y =$

Inequality: _____

X-intercept: _____ Y-intercept: _____

10. Which of the following is a solution of the inequality:

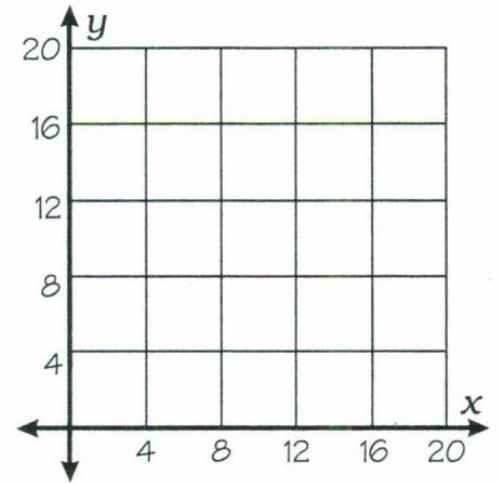
a. (8, 4)

b. (2, 7)

c. (1, 8)

11. How many hours will the faster driver be able to drive if the slower driver drives 4 hours?

12. If $x = 3$, what are all possible values of y ?



Graphing Calculator:

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.

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.

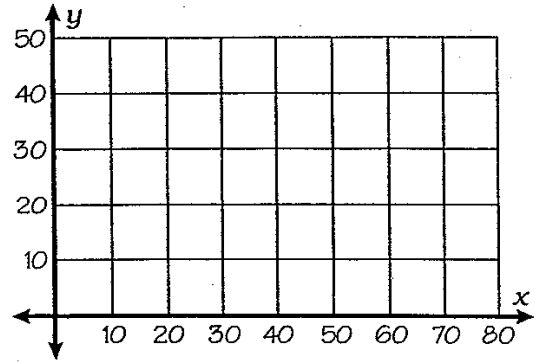
Let x = pounds of cod
 Let y = Pounds of salmon

Inequality #1: _____

X-intercept: _____ Y-intercept: _____

Inequality #2: _____

X-intercept: _____ Y-intercept: _____



Which of the following are solutions?

- 8•E** (40, 15) **11•P** (50, 18) **4•S** (30, 20) **10•U** (55, 8) **7•R** (20, 35)

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.

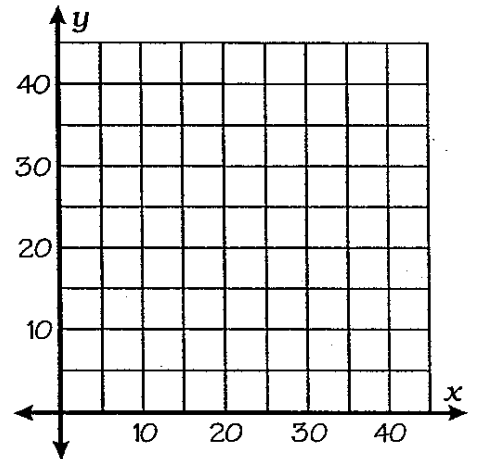
Let x = width of the garden (ft)
 Let y = length of the garden (ft)

Inequality #1: _____

X-intercept: _____ Y-intercept: _____

Inequality #2: _____

Inequality #3: _____



Which of the following are solutions?

- 7•S** (10, 23) **11•E** (7, 30) **9•T** (18, 25) **3•A** (8, 35) **2•I** (20, 20)

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.

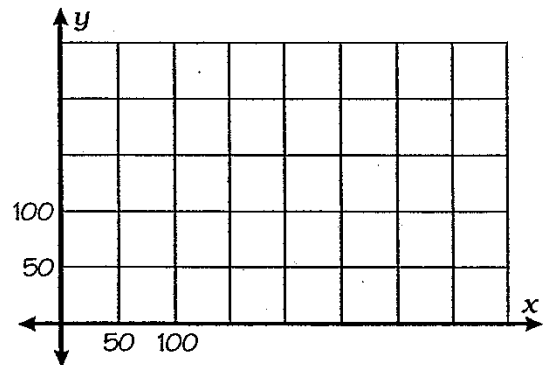
Let x = number of \$3 tickets sold
 Let y = number of \$5 tickets sold

Inequality #1: _____

X-intercept: _____ Y-intercept: _____

Inequality #2: _____

X-intercept: _____ Y-intercept: _____



Which of the following are solutions?

- 5•H** (50, 110) **12•L** (150, 70) **9•G** (280, 45) **6•U** (300, 60) **3•T** (0, 200)

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1	2	3	4	5	6	7	8	9	10	11	12	13
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