Objective Building Inequalities and Equations to Solve Problems

Warm-Up

Determine the parts of the solution set that make each inequality true.

Solution set: {1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15}

1. $x > 6$

2. $x + 2 > 6$

3. $2x + 2 > 6$

4. $6 < 2(x + 2) - 4$

Lemonade at the Pool

The concession stand at a local swimming pool sells small and large glasses of freshly squeezed lemonade. This weekend, they made more than $250 selling glasses of lemonade. A large glass of lemonade sells for $4.00, and the total sales generated from selling small glasses of lemonade was $65.

1. Write an inequality to represent the relationship between the amount they made and the number of large glasses they sold.

2. Solve the inequality. Interpret the solution in terms of the problem situation.

3. Graph the solution set on the number line.

To explore one of the last unknown regions on our planet, companies are starting to produce single-person, submersible deep-sea submarines like the Deep Flight I. Suppose the submarine Deep Flight I is going to do a dive starting at sea level, descending 480 feet every minute.

1. Identify the independent and dependent quantities and their units of measure, and define variables for these quantities. Then, write an equation to represent Deep Flight I's depth.

2. Use your equation to complete the table shown for this problem situation. Do not forget to define the quantities, units of measures, and variables for this situation.

	Independent Quantity	Dependent Quantity
Quantities		
Units of Measure		
Variables		
0		
1		
2		
3		
4		
5		
6		

3. Consider the possible values for time and depth.

a. What do you think are all the possible values for time in terms of this situation? Write an inequality to express your answer.

b. What do you think are all the possible values for depth in terms of this situation? Write an inequality to express your answer.

4. Examine your table. What do you notice about each depth value in relation to the one before and the one after?

The unit rate of change describes the amount that the dependent variable changes for every one unit that the independent variable changes.

5. In this problem, what is the unit rate of change?

6. How deep would the submarine be after:
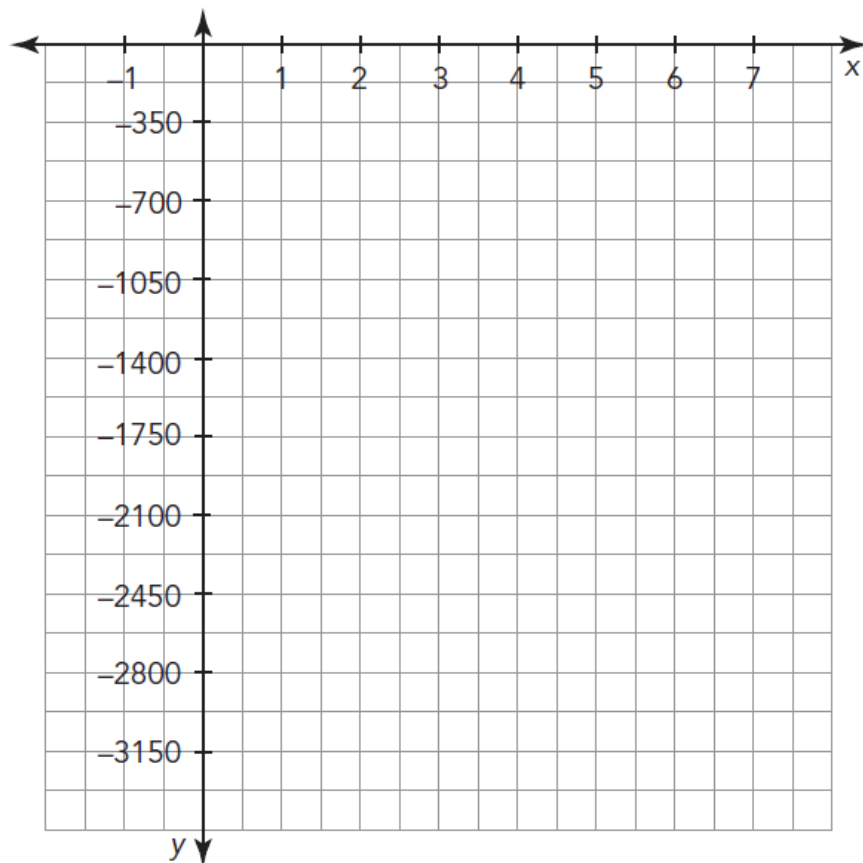
a. 2.5 minutes?

b. 90 seconds?

c. 45 seconds?

7. How many minutes would it take Deep Flight I to be:

a. 1400 feet below sea level?

b. 2100 feet below sea level?

8. Construct a graph of this problem situation. Label the units on each axis. Then, plot all the points from the table and from Questions 6 and 7. Finally, draw the graph to represent the problem situation.

LESSON 9.3a
Deep Flight 1

Objective Building Inequalities and Equations to Solve Problems

Review

1. One grocery basket is 12 inches in height. When two baskets are stacked inside of each other, the total height of the two baskets is 13.5 inches.

a. Determine the stack height for 1 basket, 2 baskets, 3 baskets, 4 baskets, and 5 baskets.

b. Write an equation to represent the stack height, s, of a given number of baskets, b.

c. Solve the equation if there are 250 baskets.

d. Solve the equation if the stack height is 125.875 feet tall.

2. Rewrite each expression with the fewest terms possible.

a. $(-2y + 3) + (-7y - 14)$ b. $(9x - 4) - 5(2x - 7)$