

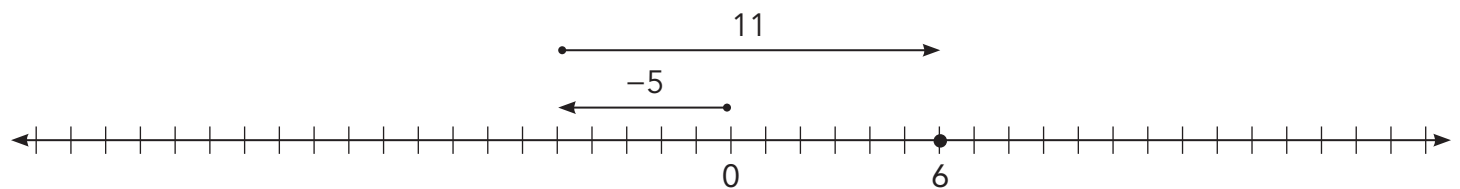
Objective Subtracting Integers

Warm-Up

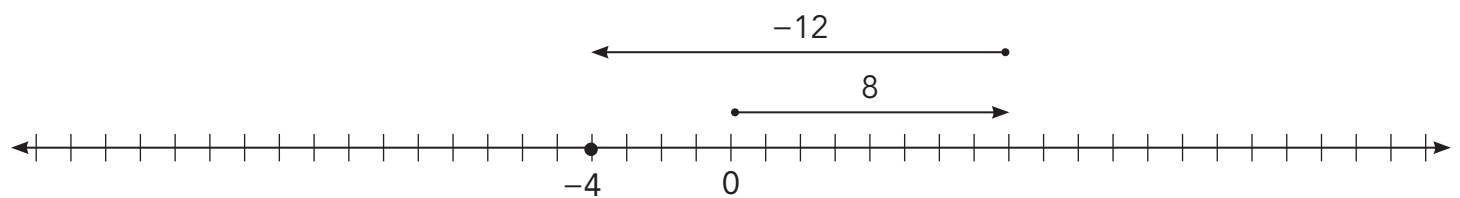


For each number line model, write the number sentence described by the model and draw a two-color counter model to represent the number sentence.

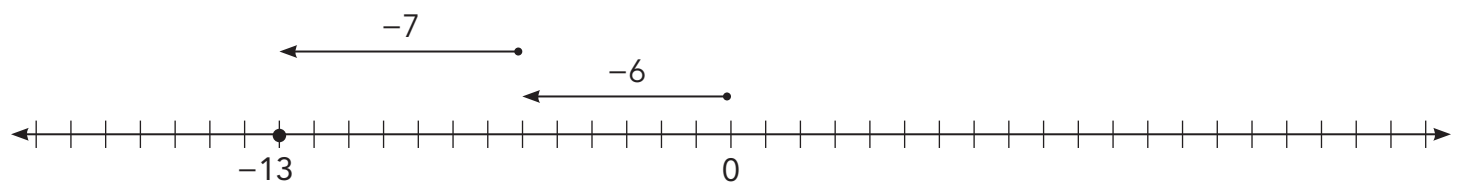
1.



2.



3.



GETTING STARTED

Take It Away

Each situation described has two different conclusions. Describe how you might model each on a number line.

1. You owe your friend \$10.

a. You borrow an additional \$5.

b. Your friend takes away \$5 of that debt.

2. The temperature is -7° .

a. Overnight it gets 12° colder.

b. During the day, it gets 12° warmer.

3. You have charged \$65 on a credit card.

a. You return an item purchased with that card that cost \$24.

b. You purchase an additional item with that card that cost \$24.

4. You dug a hole in the ground that is 20 inches deep. Your dog sees the pile of dirt and thinks it's a game.

a. He knocks 6 inches of dirt back into the hole.

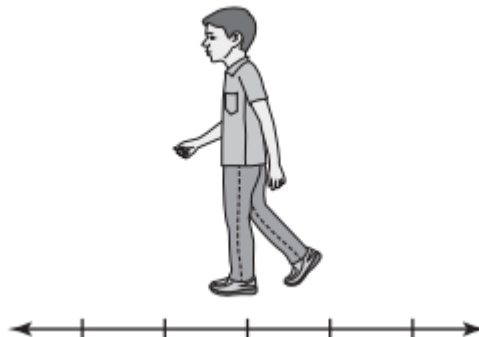
b. He digs the hole another 4 inches deeper.



Think about how you moved on the number line when you were learning to add positive and negative numbers in the previous lesson. Let's walk the line to generate rules for subtracting integers.

Walk the number line for a subtraction sentence:

- Start at zero and walk to the value of the first term of the expression.
- To indicate subtraction, turn to face down the number line, towards the lesser negative numbers.
- Walk forward if subtracting a positive number or walk backward if subtracting a negative number.



Your teacher will select a classmate to walk the line for each of the given problems. Help your classmate by preparing the directions that are needed.

1. Copy and complete the table

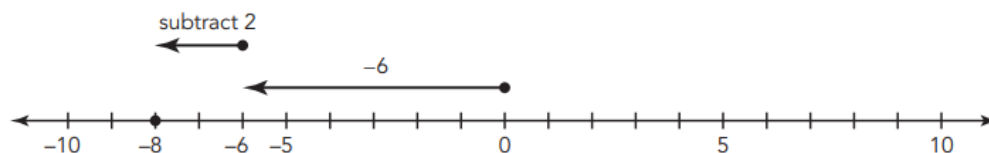
	Where You Start	Direction You face on the Number Line	Walk backwards or Forwards	Final Location
$1 - 3$				
$0 - (-4)$				
$-3 - 5$				
$-1 - (-4)$				

Cara thought about how she could take what she learned from walking the line and create a number line model on paper. She said, "Subtraction means to move in the opposite direction."

Analyze Cara's examples.

WORKED EXAMPLE

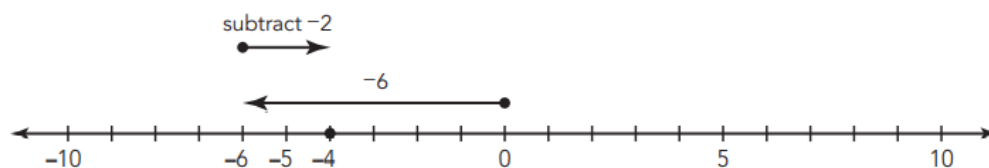
Example 1: $-6 - (+2)$



First, I moved to -6 . Then, I went in the opposite direction of adding $(+2)$ because I am subtracting $(+2)$. So, I went two units to the left and ended up at -8 .

$$-6 - (+2) = -8$$

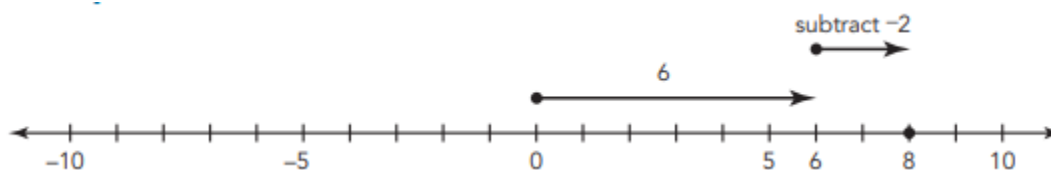
Example 2: $-6 - (-2)$



In this problem, I started by moving to -6 . Because I am subtracting (-2) , I went in the opposite direction of adding -2 . So, I moved right two units and ended up at -4 .

$$-6 - (-2) = -4$$

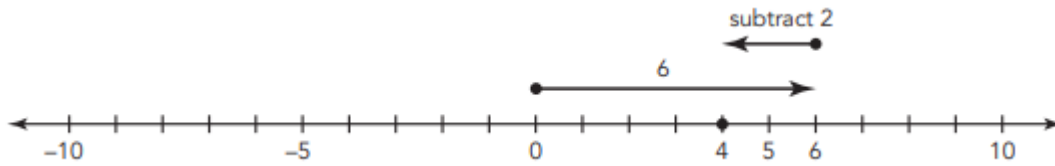
Example 3: $6 - (-2)$



2. $6 - (-2) = \underline{\hspace{2cm}}$

Explain the movement Cara modeled on the number line to determine the answer

Example 4: $6 - (+2)$

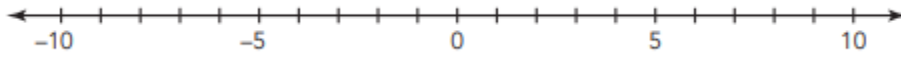


3. $6 - (+2) = \underline{\hspace{2cm}}$

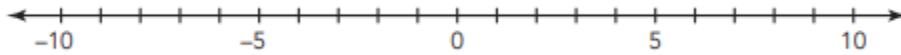
Explain the movement Cara modeled on the number line to determine the answer.

4. Use the number line to complete each number sentence.

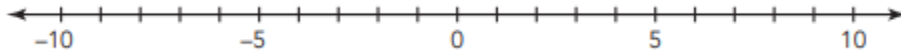
a. $-4 - (-3) = \underline{\hspace{2cm}}$



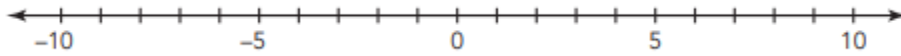
b. $-4 - (-4) = \underline{\hspace{2cm}}$



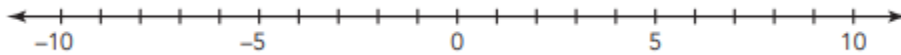
c. $-4 - 3 = \underline{\hspace{2cm}}$



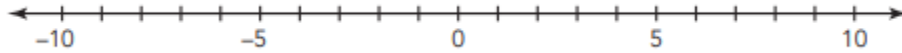
d. $-4 - 4 = \underline{\hspace{2cm}}$



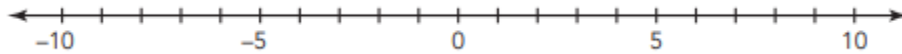
e. $4 - (-3) = \underline{\hspace{2cm}}$



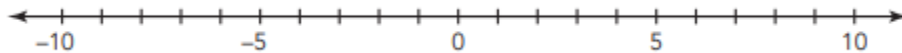
f. $4 - 4 =$ _____



g. $4 - 3 =$ _____



h. $4 - (-4) =$ _____



5. What patterns did you notice when subtracting the integers in Question 4? Describe an addition problem that is similar to each subtraction problem.

a. Subtracting two negative integers

b. Subtracting two positive integers

c. Subtracting a positive integer from a negative integer

d. Subtracting a negative integer from a positive integer

**LESSON 5.4a**
What's the Difference

Objective

Subtracting Integers**Review**

- The city of Nashville, Tennessee, constructed an exact replica of the Parthenon. In 1982, construction began on a sculpture of Athena Parthenos, which stands 41 feet 10 inches tall.
 - The sculptor first made a 1 : 10 model from clay. This means that 1 inch on the model is equal to 10 inches on the real statue. What was the height of the clay model?
 - Later the sculptor made a 1 : 5 model. This means that 1 inch on the model is equal to 5 inches on the real statue. What was the height of the model?
- Write and solve a proportion to answer each problem. Show all your work.
 - Tommy types 50 words per minute, with an average of 3 mistakes. How many mistakes would you expect Tommy to make if he typed 300 words? Write your answer using a complete sentence.
 - Six cans of fruit juice cost \$2.50. Ned needs to buy 72 cans for a camping trip for the Outdoor Club. How much will he spend?
- Solve each equation for x .
 - $72 = 55 + x$
 - $\frac{4}{5}x = 60$

