

## Section 2.3

### TERMINOLOGY

2.3

For the following term, provide 1) a definition in your own words, 2) the formal definition (as provided by your text or instructor), and 3) an example of the term using a drawing or problem.

Difference

Your definition	
Formal definition	
Example	

### READING AND SELF-DISCOVERY QUESTIONS

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- In your own words, define *subtraction*.  
**Taking away from the value representing the number, versus adding to the current number.**
- Are the rules for subtracting two integers different from the rules for adding two integers? If so, how?  
**They are not different, because a subtraction problem can be rewritten as a related addition problem where the opposite of a number is added.**
- What happens when you add the opposite of a number to a that number?  
**If you add the opposite of a number to that number, you get 0. Ex.  $a + (-a) = 0$ .**
- What happens when two negative signs are next to each other? [For example  $3 - - 5$ ] Do parentheses ( ) make a difference? [For example  $3 - (-5)$ ]  
**The subtraction of a negative number is equivalent to adding the positive number. The use of parentheses helps you to visualize that you have two negative signs.**

### CRITICAL THINKING QUESTIONS

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- Does the associative property apply to subtraction? Why or why not? Give examples.  
**The associative property does not apply to subtraction.  
ex.  $(2 - 3) - 4 = -5$  is different than  $2 - (3 - 4) = 1$ .**

2. Does the commutative property apply to subtraction? Why or why not? Give examples.

**The results of subtracting change when you switch the numbers' positions, but if you turn a subtraction problem into an addition problem,  $2 + (-3)$  can be rearranged as  $(-3) + 2$ .**

3. How would you explain the similarities and differences between adding and subtracting two numbers?

**Adding a negative number is equivalent to subtraction of a positive number.**

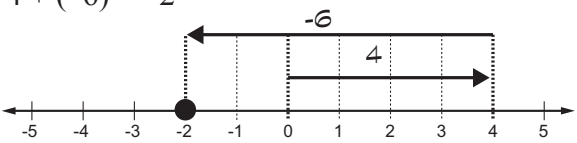
4. For what values of  $x$  and  $y$  is the following equation true:  $x - y = y - x$  Explain your answer.

**For all values when  $x = y$ . If  $x > y$ , then  $x - y$  is positive and  $y - x$  is negative. If  $y > x$  then the opposite is true:  $x - y$  is negative and  $y - x$  is positive. If  $x = y$ , then  $y - x = x - y$ .**

## DEMONSTRATE YOUR UNDERSTANDING

## 2.3

1. Validate the following expressions:

<p><b>EXAMPLE</b> <math>4 + (-6) = -2</math></p>  <p>(This is only <b>one</b> way to validate the expression!)</p>	<p>d) <math>6 - 4 = 2</math></p> <p><math>2 + 4 = 6</math></p>
<p>a) <math>(-4) + (-7) = -11</math></p> <p><math>-11 - (-7) = -11 + 7 = -4</math></p>	<p>e) <math>6 - (-4) = 10</math></p> <p><math>10 + (-4) = 10 - 4 = 6</math></p>
<p>b) <math>(-4) + 7 = 3</math></p> <p><math>3 - 7 = -4</math></p>	<p>f) <math>(-6) - 4 = -10</math></p> <p><math>-10 + 4 = -6</math></p>
<p>c) <math>3 + 2 = 5</math></p> <p><math>5 - 2 = 3</math></p>	<p>g) <math>(-6) - (-4) = -2</math></p> <p><math>-2 + (-4) = -2 - 4 = -6</math></p>

## IDENTIFY AND CORRECT THE ERROR

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In the second column, identify the error(s) you find in the following worked solution. Describe the error made in the second column. Solve the problem correctly in the third column.

Problem	Describe Error	Correct Process
Perform the necessary operations $-7 + (-2) - 5$	<b>-7 is not 7.</b>	$-7 + (-2) - 5$ $-7 - 7$ $-14$
<b>Worked Solution</b> <i>(What is wrong here?)</i>		
$-7 + (-2) - 5$ $7 - 7$ <b>0</b>		