

## Section 2.R.3 Subtraction with Integers

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### Subtraction with Integers

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For any integers  $a$  and  $b$ ,

In words, to subtract  $b$  from  $a$ , \_\_\_\_\_

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#### ▣ Example 1 Subtracting Integers

Subtract. Remember, to subtract an integer, you add its opposite.

a.  $-1 - (-5)$

c.  $-2 - (-7)$

e.  $-6 - (-6)$

b.  $-10 - 3$

d.  $4 - 5$

**Solution**

### Exercises

Perform the indicated operations.

1.  $9 - 3$

5.  $-8 - 11$

8.  $-8 - (-4)$

2.  $10 - 7$

6.  $-5 - 11$

9.  $-7 + (-13)$

3.  $13 - 20$

7.  $-5 - (-10)$

10.  $(-2) + (-15)$

4.  $17 - 22$

## Simplifying Notation

The expression  $5 - 18$  can be interpreted as subtraction or addition. In either case, the answer is the same.

$$5 - 18 = \begin{array}{ccccccc} 5 & - & (18) & = & -13 \\ \uparrow & \uparrow & \uparrow & & \uparrow \\ 5 & \text{minus} & \text{positive } 18 & \text{equals} & \text{negative } 13 \end{array}$$

$$5 - 18 = \begin{array}{ccccccc} 5 & + & (-18) & = & -13 \\ \uparrow & \uparrow & \uparrow & & \uparrow \\ 5 & \text{plus} & \text{negative } 18 & \text{equals} & \text{negative } 13 \end{array}$$

### ▣ Example 3 Addition and Subtraction with Integers

Perform the indicated operations.

a.  $-3 + 5 - 2$

b.  $5 - (-7) + (-4)$

c.  $-9 + (-2) + 6 - (-8)$

**Solution**

## Exercises

Perform the indicated operations.

11.  $-6 - 5 - 4$

14.  $-1 + 12 - 10$

17.  $-10 - (-5) + 5$

12.  $-6 - 7 - 8$

15.  $-16 + 15 - 1$

13.  $-7 + (-7) + (-8)$

16.  $-7 - (-10) + 3$

## Change in Value

To calculate the change between two values, including direction (negative for decrease, positive for increase), use the following rule: first find the \_\_\_\_\_

$$(\text{Change in value}) = \underline{\hspace{2cm}}$$

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### ▣ Example 4 Application: Calculating Change in Value

On a cold day at a ski resort, the temperature dropped from a high of  $25^{\circ}\text{F}$  at 1 p.m. to a low of  $-10^{\circ}\text{F}$  at 2 a.m. What was the change in temperature?

#### Solution

## Exercises

Solve.

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18. According to NASA, the temperature on the Earth's moon during the day is  $260^{\circ}\text{F}$  and during the night it is  $-280^{\circ}\text{F}$ . What is the daily temperature change on the moon?
  19. On July 1, a certain stock opened at \$53 per share. One month later, on August 1, the stock opened at \$60 per share. Find the change in price of the stock.
  20. If you travel from the top of Mt. Whitney, elevation 14,505 ft, to the floor of Death Valley, elevation 282 ft below sea level, what is the change in elevation?
  21. A submarine submerged 280 ft below the surface of the sea fired a rocket that reached an altitude of 30,000 ft. What was the change in altitude of the rocket?