

LESSON F4.1 – SIGNED NUMBERS I





Overview

You have already added and subtracted whole numbers, fractions and decimals. Now you will learn how to add and subtract signed numbers.

In this lesson you will work with positive and negative numbers. First, you will learn how to order them. Then you will learn how to add and subtract numbers with the same sign. You will also learn how to add and subtract numbers with different signs.

Before you begin, you may find it helpful to review the following mathematical ideas which will be used in this lesson:

To see these Review problems worked out, go to the Overview module of this lesson on the computer.

Review 1

Add whole numbers.

Do this addition: $345 + 17 + 269 = ?$

Answer: 631

Review 2

Subtract whole numbers.

Do this subtraction: $347 - 53$

Answer: 294

Review 3

Compare whole numbers.

Which one of these numbers has the greatest value? 9, 107, or 58

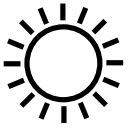
Answer: 107

Review 4

Solve an equation of the form $x + a = b$, where a and b are whole numbers.

Find the value of x that makes this statement true: $x + 21 = 50$

Answer: $x = 29$



Explain

In Concept 1: Adding, you will find a section on each of the following:

- Ordering Signed Numbers
- Finding the Absolute Value of a Number
- Adding Two Numbers with the Same Sign
- Adding Two Numbers with Different Signs
- Adding more than Two Signed Numbers

CONCEPT 1: ADDING

Ordering Signed Numbers

If you have overdrawn your checking account, the balance can be represented by a negative number. Negative numbers are also used to represent temperatures below 0°.

The number line below shows some positive and negative numbers.



The negative numbers lie to the left of zero. The positive numbers lie to the right of zero.

As you move left along the number line, the numbers decrease in value. For example, -40 lies to the left of -25 . So, -40 is less than -25 . Using ordering symbols, you can write this in the following ways:

$$-40 < -25 \quad \text{or} \quad -25 > -40$$

As you move right along the number line, the numbers increase in value. Since $+15$ lies to the right of -15 , $+15$ is greater than -15 . Using ordering symbols, you can write this in either of the following ways:

$$+15 > -15 \quad \text{or} \quad -15 < +15$$

Zero is neither positive nor negative.

You can use a number line to order signed numbers.

You can also use money or temperatures to help you order signed numbers.

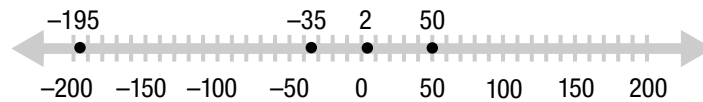
You may find these Examples useful while doing the homework for this section.

Example 1

1. Order these signed numbers from least to greatest: 2, -35 , 50, -195

Here's one way to order these signed numbers:

- Place the numbers on a number line.



- As you move right along the number line, the numbers increase in value.

$$-195 < -35 < 2 < 50$$

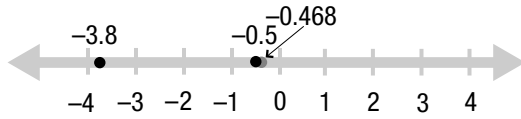
So, $-195 < -35 < 2 < 50$.

2. Order these decimal numbers from least to greatest: -3.8 , -0.468 , -0.5

Example 2

Here's a way to order these decimal numbers:

- Place the decimal numbers on a number line



- As you move right along the number line, the numbers increase in value. $-3.8 < -0.5 < -0.468$

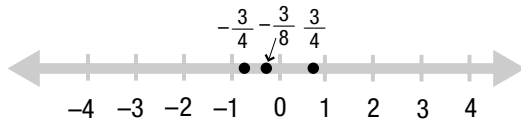
So, $-3.8 < -0.5 < -0.468$.

3. Order these fractions from least to greatest: $+\frac{3}{4}$, $-\frac{3}{4}$, $-\frac{3}{8}$

Example 3

Here's a way to order these fractions:

- Place the fractions on a number line



- As you move right along the number line, the numbers increase in value. $-\frac{3}{4} < -\frac{3}{8} < +\frac{3}{4}$

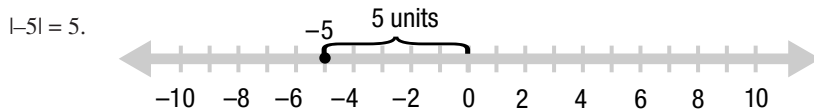
So, $-\frac{3}{4} < -\frac{3}{8} < +\frac{3}{4}$.

Absolute Value

On a number line, the distance of a number from zero is called the absolute value of the number.

These bars, $| |$, are used to indicate absolute value.

For example, on a number line, -5 lies 5 units from zero. So, the absolute value of -5 is 5. Using symbols you would write



The absolute value of a number is always greater than zero or equal to zero.

Here's a way to find the absolute value of a number:

- Write the number without its sign.

4. What is the absolute value of -36 ?

Example 4

To find the absolute value of -36 : $|-36|$

- Write -36 without its sign. 36

So, $|-36| = 36$.

Here's another way to think about absolute value:

A number has two parts, its sign and its absolute value.

As an example, for the number -36 , the sign is “ $-$ ” and the absolute value is 36. Similarly, for the number $+47$, the sign is “ $+$ ” and the absolute value is 47.

You may find these Examples useful while doing the homework for this section.

Example 5

5. What is the absolute value of +25?

To find the absolute value of +25: $|+25|$

• Write +25 without its sign. 25

So, $|+25| = 25$.

Since 25 and +25 represent the same number, you can also write $|25| = 25$.

Example 66. What is the absolute value of $4\frac{2}{5}$?To find the absolute value of $4\frac{2}{5}$: $|4\frac{2}{5}|$ • Write $4\frac{2}{5}$ without its sign. $4\frac{2}{5}$ So, $|4\frac{2}{5}| = 4\frac{2}{5}$ **Example 7**

7. Find the absolute value of -2.16.

To find the absolute value of -2.16: $|-2.16|$

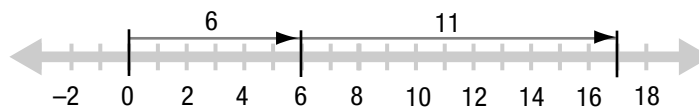
• Write -2.16 without its sign. 2.16

So, $|-2.16| = 2.16$.**Adding Numbers with the Same Sign**

Now you will learn how to add two numbers with the same sign.

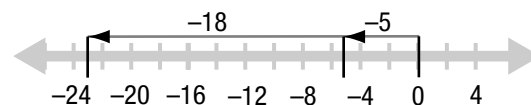
When you add two positive numbers, you get a positive number. Here's why.

When you add two positive numbers, you start to the **right** of 0, and then move farther **right**. So the result is positive. $6 + 11 = 17$



When you add two negative numbers, you get a negative number. Here's why.

When you add two negative numbers, you start to the **left** of 0, and then move farther **left**. So the result is negative. $-5 + (-18) = -23$



These observations suggest a way to add two numbers with the same sign.

To add two numbers with the same sign:

- Write each number without its sign.
- Add these numbers.
- Attach the sign of the original numbers to the result.

8. Do this addition: $-12,473 + (-7,059)$

Here's one way to do the addition:

$$-12,473 + (-7,059)$$

• Write each number without its sign.

$$12473$$

$$+ 7059$$

• Add these numbers.

$$19532$$

• Attach the negative sign to the result.

$$-19532$$

$$\text{So, } -12,473 + (-7,059) = -19,532.$$

Example 8

You may find these Examples useful while doing the homework for this section.

The parentheses are used to separate the “+” and “-” signs.

Here's how to do this addition on a calculator: $-12,473 + (-7,059)$

On the calculator, you'll see:

• Enter 12473 12473

• Press +/- -12473

• Press + -12473

• Enter 7059 7059

• Press +/- -7059

• Press = -19532

$$\text{So, } -12,473 + (-7,059) = -19,532$$

9. Do this addition: $-2\frac{1}{3} + \left(-7\frac{1}{3}\right)$

Here's one way to do the addition:

$$-2\frac{1}{3} + \left(-7\frac{1}{3}\right)$$

• Write each number without its sign.

$$2\frac{1}{3} + 7\frac{1}{3}$$

• Add these numbers.

$$= 9\frac{2}{3}$$

• Attach the negative sign to the result.

$$-9\frac{2}{3}$$

$$\text{So, } -2\frac{1}{3} + \left(-7\frac{1}{3}\right) = -9\frac{2}{3}.$$

Example 9

10. Do this addition: $-0.45 + (-0.684)$

Here's one way to do the addition:

$$-0.45 + (-0.684)$$

• Write each number without its sign.

$$0.450$$

$$+ 0.684$$

• Add these numbers.

$$1.134$$

• Attach the negative sign to the result.

$$-1.134$$

$$\text{So, } -0.45 + (-0.684) = -1.134.$$

Example 10

Remember: When you add two positive numbers, you get a positive number. When you add two negative numbers, you get a negative number.

Adding Two Numbers with Different Signs

Sometimes you will need to be able to add two numbers whose signs are different.

Here's a way to add two numbers with different signs:

- Write each number without its sign.
- Decide which of these numbers is greater and notice its original sign.
- Subtract the smaller of these numbers from the greater number.
- Attach the original sign of the greater number.

You may find these Examples useful while doing the homework for this section.

Example 11

11. Do this addition: $-7,059 + 12,473$

Here's one way to do the addition: $-7,059 + 12,473$

- Write each number without its sign. $7,059 \quad 12,473$
- Decide which of these numbers is greater. $7,059 < 12,473$
Notice the original sign of this greater number. positive (+)

- Subtract the smaller number from the greater number $\begin{array}{r} 12473 \\ - 7059 \\ \hline 5414 \end{array}$

- Attach the original sign of the greater number to the result. $+5,414$

So, $-7,059 + 12,473 = 5,414$.

Here's how to do this addition on a calculator: $-7,059 + 12,473$

On the calculator, you'll see:

- Enter 7059 7059
- Press +/- $- 7059$
- Press + $- 7059$
- Enter 12473 12473
- Press = 5414

So, $-7,059 + 12,473 = 5,414$

Example 12

12. Do this addition: $-4027 + 3615$

Here's a way to do the addition: $-4027 + 3615$

- Write each number without its sign. $4027 \quad 3615$
- Decide which of these numbers is greater. $4027 > 3615$
Notice the original sign of this greater number. negative (-)

- Subtract the smaller number from the greater number $\begin{array}{r} 4027 \\ - 3615 \\ \hline 412 \end{array}$

- Attach the original sign of the greater number to the result. -412

So, $-4027 + 3615 = -412$.

Here's another way to figure out the sign of the answer when you add two numbers with different signs.

The answer has the sign of the number with the greatest absolute value.

Here are some examples:

$-3 + 18 = 15$ Here the answer is positive because $|18| > |-3|$.

$-16 + 9 = -7$ Here the answer is negative because $|-16| > |9|$.

Example 13

13. Do this addition: $3\frac{1}{7} + \left(-5\frac{4}{7}\right)$

Here's one way to do the addition: $3\frac{1}{7} + \left(-5\frac{4}{7}\right)$

- Write each number without its sign. $3\frac{1}{7} \quad 5\frac{4}{7}$
- Decide which of these numbers is greater. $3\frac{1}{7} < 5\frac{4}{7}$
Notice the original sign of this greater number. negative (-)

- Subtract the smaller number from the greater number $5\frac{4}{7} - 3\frac{1}{7} = 2\frac{3}{7}$

- Attach the original sign of the greater number to the result. $-2\frac{3}{7}$

So, $3\frac{1}{7} + \left(-5\frac{4}{7}\right) = -2\frac{3}{7}$.

14. Do this addition: $-0.37 + 0.495$

Example 14

Here's one way to do the addition: $-0.37 + 0.495$

- Write each number without its sign. $0.37 \quad 0.495$
- Decide which of these numbers is greater. $0.37 < 0.495$
Notice the original sign of this greater number. positive (+)
- Subtract the smaller number from the greater number 0.495
 $\underline{-0.370}$
 0.125
- Attach the original sign of the greater number to the result $+0.125$

So, $-0.37 + 0.495 = 0.125$.

Adding More Than Two Signed Numbers

Sometimes it is necessary to add more than two signed numbers.

Here's one way to add more than two signed numbers.

- Add the positive numbers.
- Add the negative numbers.
- Add the results of the first two steps.

Here's another way to add more than two signed numbers.

- Do the addition from left to right.

15. Do this addition: $-45 + 7 + (-18) + (-15) + 23 + (-5)$

Example 15

Here's one way to do this addition: $45 + 7 + (-18) + (-15) + 23 + (-5)$

- Add the positive numbers. 7
 $+ 23$
 30
- Add the negative numbers. -45
 -18
 -15
 $+ - 5$
 -83
- Add the results of the first two steps. $30 + (-83)$
- Write each number without its sign. $30 \quad 83$
- Decide which of these numbers is greater. $30 < 83$
Notice the original sign of this greater number. negative (-)
- Subtract the smaller number from the greater number. 83
 $\underline{-30}$
 53
- Attach the original sign of the greater number to the result. -53

So, $-45 + 7 + (-18) + (-15) + 23 + (-5) = -53$.

You may find these Examples useful while doing the homework for this section.

Remember, to add numbers with the same sign, you ignore the sign and add. Then attach the sign of the numbers. In this case you attach a negative sign.

Example 1616. Do this addition: $-45 + 7 + (-18) + (-15) + 23 + (-5)$ *Here's another way to do this addition:* $-45 + 7 + (-18) + (-15) + 23 + (-5)$

$$\begin{aligned}
 &\bullet \text{ Do the addition from left to right.} && -45 + 7 + (-18) + (-15) + 23 + (-5) \\
 &&& = -38 + (-18) + (-15) + 23 + (-5) \\
 &&& = -56 + (-15) + 23 + (-5) \\
 &&& = -71 + 23 + (-5) \\
 &&& = -48 + (-5) \\
 &&& = -53
 \end{aligned}$$

So, $-45 + 7 + (-18) + (-15) + 23 + (-5) = -53$.**Example 17**17. Do this addition: $-0.3 + 4.5 + (-6.1)$ *Here's one way to do this addition:* $-0.3 + 4.5 + (-6.1)$

$$\begin{aligned}
 &\bullet \text{ Add the negative numbers.} && -0.3 \\
 &&& \quad \underline{+ -6.1} \\
 &&& -6.4 \\
 &\bullet \text{ Add the result of the first step to 4.5.} && 4.5 + (-6.4) \\
 &\bullet \text{ Write each number without its sign.} && 4.5 \quad 6.4 \\
 &\bullet \text{ Decide which of these numbers is greater.} && 4.5 < 6.4 \\
 &\quad \text{Notice the original sign of this greater number.} && \text{negative } (-) \\
 &\bullet \text{ Subtract the smaller number from the} && 6.4 \\
 &\quad \text{greater number.} && \underline{- 4.5} \\
 &&& 1.9 \\
 &\bullet \text{ Attach the original sign of the} && -1.9 \\
 &\quad \text{greater number to the result.} &&
 \end{aligned}$$

So, $-0.3 + 4.5 + (-6.1) = -1.9$ **Example 18**18. Do this addition: $-\frac{4}{9} + 1\frac{2}{9} + \left(-3\frac{1}{3}\right)$

$$\begin{aligned}
 &\text{Here's a way to do this addition:} && -\frac{4}{9} + 1\frac{2}{9} + \left(-3\frac{1}{3}\right) \\
 &\bullet \text{ Do the addition from left to right.} && -\frac{4}{9} + 1\frac{2}{9} + \left(-3\frac{1}{3}\right) \\
 &&& = -\frac{4}{9} + \frac{11}{9} + \left(-3\frac{1}{3}\right) \\
 &&& = \frac{7}{9} + \left(-3\frac{1}{3}\right) \\
 &&& = \frac{7}{9} + \left(-3\frac{3}{9}\right) \\
 &&& = -2\frac{5}{9}
 \end{aligned}$$

So, $-\frac{4}{9} + 1\frac{2}{9} + \left(-3\frac{1}{3}\right) = -2\frac{5}{9}$.



Explain

In Concept 2: Subtracting, you will find a section on each of the following:

- Finding the Opposite of a Number
- Writing a Subtraction as an Equivalent Addition
- Subtracting Signed Numbers
- Subtracting More than One Signed Number
- Solving Certain Equations that Contain Signed Numbers

Remember, you can also write +282 as 282.

A number and its opposite add to zero.

For example, $-6 + 6 = 0$

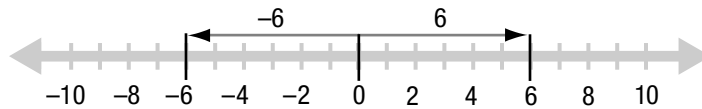
and $+28 + (-28) = 0$

CONCEPT 2: SUBTRACTING

The Opposite of a Number

Before you learn how to subtract signed numbers, it will be helpful to see what is meant by the opposite of a number.

On the number line, the opposite of a number is a number that is the same distance from zero but in the opposite direction.



For example, the opposite of -282 is $+282$.

The opposite of $+3126$ is -3126 .

To find the opposite of a number:

- Change its sign.

The opposite of zero is zero.

Example 19

19. Find the opposite of -58 .

To find the opposite of -58 :

- Change its sign.

58

So, the opposite of -58 is 58.

Example 20

20. Find the opposite of $\frac{2}{5}$.

To find the opposite of $\frac{2}{5}$:

- Change its sign.

$-\frac{2}{5}$

So, the opposite of $\frac{2}{5}$ is $-\frac{2}{5}$.

Writing a Subtraction as an Equivalent Addition

Before you learn how to subtract signed numbers, it will be helpful to learn how to write a subtraction as an equivalent addition.

To subtract a number, you add its opposite. This suggests a way to rewrite a subtraction as an addition.

To rewrite a subtraction as an addition:

- Change the subtraction symbol to an addition symbol.
- Change the sign of the number being subtracted.

Example 21

21. Rewrite $-2\frac{1}{4} - \frac{3}{8}$ as an addition.

To rewrite the subtraction as an addition: $-2\frac{1}{4} - \frac{3}{8}$

• Change the subtraction symbol to an addition symbol. $-2\frac{1}{4} + \frac{3}{8}$

• Change the sign of the number being subtracted. $-2\frac{1}{4} + \left(-\frac{3}{8}\right)$

So, $-2\frac{1}{4} - \frac{3}{8}$ can be written as $-2\frac{1}{4} + \left(-\frac{3}{8}\right)$.

Example 22

22. Rewrite $18 - (-11)$ as an addition.

To rewrite the subtraction as an addition: $18 - (-11)$

• Change the subtraction symbol to an addition symbol. $18 + (-11)$

• Change the sign of the number being subtracted. $18 + (+11)$

So, $18 - (-11)$ can be written as $18 + (+11)$.

Since $+11$ can be written with or without a positive sign, $18 + (+11)$ can be written as $18 + 11$.

So, $18 - (-11)$ can also be written as $18 + 11$.

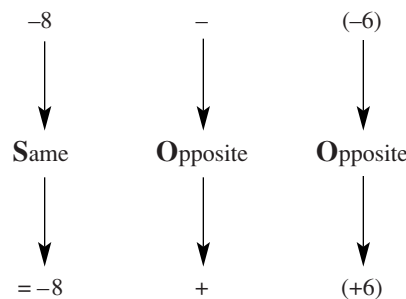
When you change a subtraction to an addition, you can use this word

SOO

to help you remember how to change the signs:

SOO stands for **S**ame **O**pposite **O**pposite, where “opposite” stands for a change in sign.

For example,



Subtracting Signed Numbers

You have already seen how to rewrite a subtraction as an equivalent addition.

Now you will subtract signed numbers.

To subtract signed numbers:

- Rewrite the subtraction as an addition.
Change the subtraction symbol to an addition symbol.
Change the sign of the number being subtracted.
- Do the addition.

23. Do this subtraction: $5654 - (-282)$

Here's how to do the subtraction:

$$5654 - (-282)$$

- Rewrite the subtraction as an addition.
Change the subtraction symbol to an addition symbol.
Change the sign of the number being subtracted.

$$5654 + (-282)$$

$$5654 + (+282)$$

- Do the addition.

$$5936$$

$$\text{So, } 5654 - (-282) = 5936.$$

Example 23

Here's how to use a calculator to do this subtraction:

On the calculator, you will see:

Enter 5654 5654

Press - 5654

Enter 282 282

Press +/- -282

Press = 5936

$$\text{So, } 5654 - (-282) = 5936.$$

24. Do this subtraction: $-0.27 - (-1.58)$

Here's how to do the subtraction:

$$-0.27 - (-1.58)$$

- Rewrite the subtraction as an addition.
Change the subtraction symbol to an addition symbol.
Change the sign of the number being subtracted.

$$-0.27 + (-1.58)$$

$$-0.27 + (+1.58)$$

- Do the addition.

$$1.31$$

$$\text{So, } -0.27 - (-1.58) = 1.31.$$

Example 24

25. Do this subtraction: $-2\frac{1}{5} - 4\frac{3}{5}$

Here's how to do the subtraction:

- Rewrite the subtraction as an addition.

$$-2\frac{1}{5} - 4\frac{3}{5}$$

Change the subtraction symbol to an addition symbol.

$$-2\frac{1}{5} + 4\frac{3}{5}$$

Change the sign of the number being subtracted.

$$-2\frac{1}{5} + \left(-4\frac{3}{5}\right)$$

- Do the addition.

$$-6\frac{4}{5}$$

$$\text{So, } -2\frac{1}{5} - 4\frac{3}{5} = -6\frac{4}{5}.$$

Example 25

Subtracting More Than One Signed Number

Now you are ready to subtract more than one signed number.

To subtract more than one signed number:

- Rewrite each subtraction as an addition.
Change the subtraction symbols to addition symbols.
Change the sign of the numbers being subtracted.
- Do the addition.

You may find these examples useful while doing the homework for this section.

Example 26

26. Find: $2.9 - (-1.54) + 3.82 - 0.4$

Here's one way to do this:

$$2.9 - (-1.54) + 3.82 - 0.4$$

- Rewrite each subtraction as an addition.

$$2.9 + (-1.54) + 3.82 + 0.4$$

Change the subtraction symbols to addition symbols.

Change the sign of the numbers being subtracted.

$$2.9 + (+1.54) + 3.82 + (-0.4)$$

- Do the addition. Add from left to right.

$$\begin{aligned} &= 2.9 + (+1.54) + 3.82 + (-0.4) \\ &= 4.44 + 3.82 + (-0.4) \\ &= 8.26 + (-0.4) \\ &= 7.86 \end{aligned}$$

So, $2.9 - (-1.54) + 3.82 - 0.4 = 7.86$.

Example 27

27. Find: $\frac{1}{5} - \left(-\frac{3}{5}\right) - 3\frac{2}{5}$

Here's a way to do this:

$$\frac{1}{5} - \left(-\frac{3}{5}\right) - 3\frac{2}{5}$$

- Rewrite each subtraction as an addition.

$$\frac{1}{5} + \left(-\frac{3}{5}\right) + 3\frac{2}{5}$$

Change the subtraction symbols to addition symbols.

Change the sign of the numbers being subtracted.

$$\frac{1}{5} + \left(+\frac{3}{5}\right) + \left(-3\frac{2}{5}\right)$$

- Do the addition. Add from left to right.

$$\frac{1}{5} + \left(+\frac{3}{5}\right) + \left(-3\frac{2}{5}\right)$$

$$\begin{aligned} &= \frac{4}{5} + \left(-3\frac{2}{5}\right) \\ &= -2\frac{3}{5} \end{aligned}$$

So, $\frac{1}{5} - \left(-\frac{3}{5}\right) - 3\frac{2}{5} = -2\frac{3}{5}$.

Solving an Equation

Now that you can add and subtract signed numbers, you are ready to solve equations that contain signed numbers.

Remember, when you solve an equation, you find a value of the variable which makes the equation true.

To solve an equation:

- Get x by itself on one side of the equation.

28. Solve this equation for x : $x + \frac{3}{5} = -2\frac{1}{5}$

Example 28

To solve the equation for x :

$$x + \frac{3}{5} = -2\frac{1}{5}$$

- Get x by itself on one side of the equation.

Subtract $\frac{3}{5}$ from both sides of the equation.

$$x + \frac{3}{5} - \frac{3}{5} = -2\frac{1}{5} - \frac{3}{5}$$

$$x + 0 = -2\frac{1}{5} - \frac{3}{5}$$

- Now x is by itself on the left side of the equation.

$$x = -2\frac{1}{5} - \frac{3}{5}$$

Rewrite the subtraction as an addition.

$$x = -2\frac{1}{5} + \left(-\frac{3}{5}\right)$$

$$x = -2\frac{4}{5}$$

So, $x = -2\frac{4}{5}$.

Check:

Replace x with $-2\frac{4}{5}$ in the original equation.

$$x + \frac{3}{5} = -2\frac{1}{5}$$

$$\text{Is } -2\frac{4}{5} + \frac{3}{5} = -2\frac{1}{5} \text{ ?}$$

$$\text{Is } -2\frac{1}{5} = -2\frac{1}{5} \text{ ? Yes}$$

29. Solve this equation for x : $x - 3.5 = -7.9$

Example 29

To solve the equation for x :

$$x - 3.5 = -7.9$$

- Get x by itself on one side of the equation.

Add 3.5 to both sides of the equation.

$$x - 3.5 + 3.5 = -7.9 + 3.5$$

$$x + 0 = -7.9 + 3.5$$

- Now x is by itself on the left side of the equation.

$$x = -7.9 + 3.5$$

Do the addition.

$$x = -4.4$$

So, $x = -4.4$.

Check:

Replace x with -4.4 in the original equation.

$$x - 3.5 = -7.9$$

$$\text{Is } -4.4 - 3.5 = -7.9 \text{ ?}$$

$$\text{Is } -7.9 = -7.9 \text{ ? Yes}$$

This Explore contains two investigations.

- **Tracking Temperatures**
- **Efficient Calculating**

You have been introduced to these investigations in the Explore module of this lesson on the computer. You can complete them using the information given here.

Investigation 1: Tracking Temperatures

Pick a city in the North Eastern or Northern Midwest section of the United States. Using resources available in the school library, the local library, or the Internet, record the daily temperatures in the city for two weeks (14 days) during January over the past 3 years. Include the high and low temperatures and their difference. Make note of the temperatures wind-chill factors if they exist.

1. Name of the city you picked. _____
Record the temperatures in the tables below.

Year 1: January

Date	High Temp.	Low Temp.	Difference: High Temp. – Low Temp.	Temp w/Wind Chill Factor
Day 1				
Day 2				
Day 3				
Day 4				
Day 5				
Day 6				
Day 7				
Day 8				
Day 9				
Day 10				
Day 11				
Day 12				
Day 13				
Day 14				

Year 2: January

Date	High Temp.	Low Temp.	Difference: High Temp. – Low Temp.	Temp w/Wind Chill Factor
Day 1				
Day 2				
Day 3				
Day 4				
Day 5				
Day 6				
Day 7				
Day 8				
Day 9				
Day 10				

Date	High Temp.	Low Temp.	Difference: High Temp. – Low Temp.	Temp w/Wind Chill Factor
Day 11				
Day 12				
Day 13				
Day 14				

Year 3: January

Date	High Temp.	Low Temp.	Difference: High Temp. – Low Temp.	Temp w/Wind Chill Factor
Day 1				
Day 2				
Day 3				
Day 4				
Day 5				
Day 6				
Day 7				
Day 8				
Day 9				
Day 10				
Day 11				
Day 12				
Day 13				
Day 14				

2. Find the following averages for each 14-day period. (Add the temperatures for each day and divide the result by 14, the number of days.)
 - a. The average Low Temp.: Year 1: _____ Year 2: _____ Year 3: _____
 - b. The average High Temp.: Year 1: _____ Year 2: _____ Year 3: _____
 - c. The average difference:
High Temp. – Low Temp. Year 1: _____ Year 2: _____ Year 3: _____

3.
 - a. Which year was the coldest during the 14 days in January?

 - b. Which year was the warmest during the 14 days in January?

 - c. Which year experienced the largest average difference in temperature during the 14 days in January?

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4. Use the averages from (1) to calculate the average high and low temperature for the city in January. Is this an accurate estimate of what temperatures to expect for January in this city? Explain your answer.

 5. What effect does the wind-chill factor have on temperature? If there were wind-chill factors given for your city, calculate the averages using the temperatures obtained when taking wind-chill into account.

Investigation 2: Efficient Calculating

1. When you use a calculator to do arithmetic with signed numbers, you often need to use the +/- key. This can add a lot of keystrokes to your calculation depending on the statement of the problem. Rewrite the given expressions, so that you use the +/- key the least number of times. Calculate the value of each expression.
 - a. $10 - (-8) + (-16) - 3$
 - b. $9 + (-25) - (-21) + (-4) - (-10)$
 - c. $4.5 + (-3.6) - (-7.1) - 2.9$
 - d. $7.8 - (-4.9) + (-9.2) - (-2.1)$
 - e. Can you evaluate these expressions without using the +/- key? Explain.

 - f. Is there a situation where you must use the +/- key? Explain.

-
2. To evaluate the expressions above, you probably used the $-$ key on your calculator. What is the difference between the $+/-$ key and the $-$ key? To help you answer this question, evaluate the expressions below. You may first want to rewrite them so that you use the $+/-$ key the least number of times.

a. $-4 + (-10) - 6 - (-8)$

b. $-19 + 11 - (-41) + (-25)$

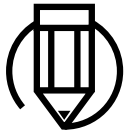
c. $-2.4 - 3.6 - (-5.1) + (-7.2)$

d. $-4.7 + (-5.9) - (-18.3) - 7.2$

- e. Can you evaluate these expressions without using the $+/-$ key? Explain.

- f. Is there a situation where you must use the $+/-$ key? Explain.

- g. Explain the difference between the $-$ key and the $+/-$ key.



Homework

CONCEPT 1: ADDING

Ordering Signed Numbers

For help working these types of problems, go back to Examples 1–3 in the Explain section of this lesson.

- Using the ordering symbol $<$, order these signed numbers from least to greatest: $-4, 5, -6, 9$
- Using the ordering symbol $<$, order these signed numbers from least to greatest: $23, -75, -42, 42$
- Using the ordering symbol $<$, order these signed numbers from least to greatest: $-54, -21, -6, -87$
- Using the ordering symbol $<$, order these signed numbers from least to greatest: $8, -7, 45, -8$
- Using the ordering symbol $<$, order these signed numbers from least to greatest: $121, -121, -345, 370$
- Using the ordering symbol $<$, order these signed numbers from least to greatest: $419, 0, -539, -420$
- Using the ordering symbol $<$, order these decimal numbers from least to greatest: $-3.1, 4.5, -2.9, 2.7$
- Using the ordering symbol $<$, order these decimal numbers from least to greatest: $5.123, -3.432, -5.209, 8.234$
- Using the ordering symbol $<$, order these decimal numbers from least to greatest: $0.4732, -0.1223, 0.987, -0.001$
- Using the ordering symbol $<$, order these decimal numbers from least to greatest: $-3.422, -9.329, -2.114, -1.998$
- Using the ordering symbol $<$, order these fractions from least to greatest: $\frac{3}{4}, -\frac{2}{3}, \frac{7}{9}, -\frac{2}{5}$
- Using the ordering symbol $<$, order these fractions from least to greatest: $1\frac{3}{5}, -2\frac{2}{3}, 3\frac{1}{3}, -2\frac{1}{3}$
- Using the ordering symbol $<$, order these fractions from least to greatest: $\frac{4}{5}, -\frac{2}{5}, -\frac{5}{9}, \frac{1}{6}$
- Using the ordering symbol $<$, order these fractions from least to greatest: $-2\frac{1}{2}, -2\frac{3}{5}, -2\frac{3}{4}, 2\frac{1}{2}$
- True or False. Every negative number has a value less than 0.
- True or False. Some negative numbers have values which are greater than some positive numbers.
- The temperature in a certain town was -10° on Monday night and -15° on Tuesday night. Order these temperatures from least to greatest.
- On Wednesday, the temperature in a certain city was 10° . On Thursday, the temperature was -10° .
Order these temperatures from least to greatest.
- Carl, Mark, and Jim were playing golf. At the end of nine holes their scores, relative to par, were 4, 2, and -2 , respectively.
Order these scores from least to greatest.
- Macy, Ellen, and Susanne were playing a card game. At the end of three rounds, their scores were -13 , -15 , and 25, respectively.
Order these scores from least to greatest.
- A submarine is 20 feet below sea level which can be represented by -20 feet. It dives to a depth of -549 feet.
Order these depths from least to greatest.
- An airplane is flying at an altitude of 30,000 feet. To avoid some turbulence, it decreases its altitude to 25,000 feet.
Order these altitudes from least to greatest.

-
23. During five consecutive days the balances in Paula's checkbook were: \$425.15, \$110.07, -\$12.25, -\$15.00, \$230.64. Order these balances from least to greatest.
24. The price of a stock can rise or fall. A rise in price is represented by a positive number and a fall is represented by a negative number. A certain stock had the following five-day record: $-\frac{3}{8}$, $\frac{5}{8}$, $\frac{1}{4}$, $-\frac{7}{8}$, $\frac{1}{8}$. Order these numbers from least to greatest.

Absolute Value

For help working these types of problems, go back to Examples 4–7 in the Explain section of this lesson.

25. Find this absolute value: $|13|$
26. Find this absolute value: $|-13|$
27. Find this absolute value: $|1|$
28. Find this absolute value: $|0|$
29. Find this absolute value: $\left| -1\frac{2}{5} \right|$
30. Find this absolute value: $\left| -2\frac{4}{9} \right|$
31. Find this absolute value: $|-3.54|$
32. Find this absolute value: $|1.31|$
33. True or False: $|-21| < |15|$
34. True or False: $|-10| < |10|$
35. True or False: $|-15| < |-21|$
36. True or False: $|-15| < |21|$
37. True or False: $|-10| \leq |10|$
38. True or False: $|-21| \leq |15|$
39. True or False: $|-15| \leq |21|$
40. True or False: $|0| < |-15|$
41. On a Monday, the high temperature in a certain town was 42° . Find the absolute value of 42.
42. On a Saturday, the high temperature in a certain town was -3° . Find the absolute value of -3 .
43. Alice's checking account is overdrawn by \$23. Her account balance is represented by -23 . Find the absolute value of -23 .
44. Alice makes a deposit to her checking account and the balance is now \$45. Find the absolute value of 45.
45. Knute plays football. On one play he was stopped for a loss of 5 yards. His yardage for the play is recorded as -5 yards. Find the absolute value of -5 .
46. On the third down, Knute gained 15 yards. His yardage for this play is recorded as $+15$ yards. Find the absolute value of $+15$.
47. A submarine is 300 feet below sea level. This can be represented by -300 feet. Find the absolute value of -300 .
48. A certain town has an elevation of 275 feet above sea level. This can be represented by $+275$ feet. Find the absolute value of $+275$.

Adding Two Numbers with the Same Sign

For help working these types of problems, go back to Examples 8–10 in the Explain section of this lesson.

49. Find: $245 + 742$
50. Find: $-241 + (-375)$
51. Find: $-689 + (-32)$
52. Find: $627 + 29$
53. Find: $-3287 + (-1238)$
54. Find: $-183,874 + (-329,184)$
55. Find: $\frac{3}{5} + \frac{2}{3}$
56. Find: $-\frac{2}{3} + \left(-\frac{1}{6}\right)$
57. Find: $-1\frac{4}{5} + -\frac{3}{4}$
58. Find: $2\frac{5}{6} + \frac{1}{3}$
59. Find: $-3\frac{4}{7} + \left(-2\frac{2}{7}\right)$
60. Find: $-5\frac{3}{4} + \left(-2\frac{7}{8}\right)$
61. Find: $32.45 + 67.32$
62. Find: $-15.38 + (-21.55)$
63. Find: $1.005 + (2.0004)$
64. Find: $-4.002 + (-2.1006)$
65. Jose is a running back on a football team. On two successive plays he gains 5 yards and 13 yards. How many total yards did Jose gain?
66. In football, on two plays, Jose loses 2 yards and then loses 3 yards. What is Jose's total loss? Note: A loss in yardage is recorded as a negative number.
67. A submarine is 20 feet below sea level. It then dives another 215 feet. How far below sea level is it now? Elevations below sea level are represented by negative numbers.
68. An airplane is flying at an altitude of 20,000 feet. It then ascends another 2500 feet. After rising the 2500 feet, what is the altitude of the airplane?
69. The balance in Tom's checkbook is $-\$35.12$. He writes a check for $\$15.32$. After writing the check, what is the balance in Tom's checkbook?
70. Stacey has a balance of $\$412.43$ in her checkbook. She makes a deposit of $\$50.00$. After making the deposit, what is the balance in Stacey's checkbook?
71. On a given day, the price of a certain stock decreases by $\frac{3}{8}$ of a dollar. The next day it decreases another $\frac{1}{4}$ of a dollar. After the two days, what is the net decrease in the price of the stock?
72. On a given day, the price of a certain stock increases by $\frac{7}{8}$ of a dollar. The next day it increases another $\frac{1}{8}$ of a dollar. After the two days, what is the net increase in the price of the stock?

Adding Two Numbers with Different Signs

For help working these types of problems, go back to Examples 11–14 in the Explain section of this lesson.

73. Find: $245 + (-742)$
74. Find: $-245 + 742$
75. Find: $325 + (-154)$
76. Find: $-589 + 798$
77. Find: $36 + (-412)$
78. Find: $25 + (-693)$
79. Find: $-1178 + 4597$
80. Find: $5983 + (-7009)$
81. Find: $\frac{5}{8} + \left(-\frac{3}{8}\right)$
82. Find: $\frac{2}{5} + \left(-\frac{4}{5}\right)$
83. Find: $\frac{7}{8} + \left(-5\frac{3}{8}\right)$
84. Find: $-2\frac{3}{4} + 4\frac{5}{8}$
85. Find: $5.4 + (-2.3)$
86. Find: $7.8 + (-15.6)$
87. Find: $-532.328 + 287.394$
88. Find: $-42.007 + 107.08$
89. George is playing golf. He scores 2 under par on the first hole which is represented by -2 . On the second hole, he scores 1 over par which is $+1$. What is George's score after the second hole?
90. Lionel's score at the end of 9 holes of golf is 7 under par which is -7 . On the tenth hole, he scores 2 over par which is $+2$. What is Lionel's score after the tenth hole?
91. Chico has a balance of \$45.72 in his checkbook. What will the balance be if he writes a check for \$62.00?
92. Blanca has a balance of $-\$23.76$ in her checkbook. What will the balance be if she makes a deposit of \$100.00?
93. A submarine is at a depth of -545 feet. Find its depth after it rises 224 feet.
94. An airplane is cruising at an altitude of 19,000 feet. Find its altitude after it descends 3420 feet.
95. The price of a certain stock increases $\frac{3}{8}$ of a dollar on a given day. The next day it decreases $\frac{5}{8}$ of a dollar. Find the net increase or decrease in the price of the stock after the two days.
96. The price of a certain stock decreases $\frac{7}{8}$ of a dollar on a given day. The next day it increases $\frac{3}{8}$ of a dollar. Find the net increase or decrease in the price of the stock after the two days.

Adding More Than Two Signed Numbers

For help working these types of problems, go back to Examples 15–18 in the Explain section of this lesson.

97. Find: $6 + (-7) + (-11)$
98. Find: $25 + 13 + (-12)$
99. Find: $231 + (-42) + 218 + (-146)$
100. Find: $-532 + (-199) + 742 + (-32)$
101. Find: $17 + (-18) + 23 + 7 + (-44)$
102. Find: $-34 + (-12) + 56 + 21 + (-19)$
103. Find: $47 + (-48) + 65 + (-74) + 2 + (-10) + 18$
104. Find: $-127 + (-975) + 387 + (-42) + 866 + 121$
105. Find: $2.4 + (-6.87) + 3.501$
106. Find: $-3.45 + 10.8 + (-4.332)$
107. Find: $54.30 + (-94.38) + (-12.87) + 75.34$
108. Find: $-127.038 + (-5.39) + 175.089 + (-39.983) + (-10.238)$
109. Find: $3\frac{1}{2} + \left(-\frac{7}{8}\right) + \left(-2\frac{1}{4}\right)$
110. Find: $-4\frac{3}{4} + 5\frac{2}{3} + \left(-1\frac{3}{5}\right)$
111. Find: $\frac{3}{8} + \left(-2\frac{5}{8}\right) + \frac{3}{16} + \left(-5\frac{1}{4}\right)$
112. Find: $-\frac{3}{5} + \left(-4\frac{7}{8}\right) + 6\frac{2}{3} + \left(-\frac{3}{4}\right)$
113. Tory is playing football. On five consecutive plays, he gained 3 yards, lost 5 yards, gained 10 yards, gained 25 yards and lost 2 yards. What was Tory's net loss or gain after the five plays?
114. Stephan is playing football. On four consecutive plays, he lost 2 yards, lost 7 yards, gained 5 yards and gained 3 yards. What was Stephan's net loss or gain after the four plays?
115. Telson's checking account balance is \$532.98. Find the balance of Telson's checking account after he writes a check for \$345.78 and makes a deposit of \$122.43
116. Trina's savings account balance is \$3500.79. Find the balance of Trina's savings account after she makes a withdrawal of \$1900.00 and a deposit of \$2550.00.
117. John's scores, relative to par, on 5 holes of golf are -2 , -1 , $+3$, $+2$, and -2 . What is his net score after the fifth hole?
118. Joanne's score, relative to par, after nine holes of golf is -6 . On the next three holes she scores $+1$, -2 , and -1 . What is her score now?
119. Over a three day period, the price of a certain stock increases $\$ \frac{7}{8}$, decreases $\$ \frac{5}{8}$, and increases $\$ \frac{3}{4}$.
What is the net increase or decrease in the price of the stock?
120. Over a three day period, the price of a certain stock decreases $\$ \frac{1}{2}$, decreases $\$ \frac{1}{4}$, and increases $\$ \frac{3}{8}$.
What is the net increase or decrease in the price of the stock?

CONCEPT 2: SUBTRACTING

The Opposite of a Number

For help working these types of problems, go back to Examples 19–20 in the Explain section of this lesson.

121. Find the opposite of 42.
122. Find the opposite of -57 .
123. Find the opposite of -563 .
124. Find the opposite of 432.
125. Find the opposite of 3.87.
126. Find the opposite of -344.909 .
127. Find the opposite of 0.000001.
128. Find the opposite of 2000.0001.
129. Find the opposite of 0.00.
130. Find the opposite of -0.000002 .
131. Find the opposite of $5\frac{3}{17}$.
132. Find the opposite of $-\frac{9}{25}$.
133. Find the opposite of $6\frac{7}{8}$.
134. Find the opposite of $2\frac{1}{100}$.
135. Find the opposite of $-\frac{1}{10,000}$.
136. Find the opposite of $-\frac{27}{100}$.
137. An airplane is flying at an altitude of 1500 feet. Find the opposite of 1500 feet.
138. A submarine is at a depth of 249 feet. This can be represented by -249 feet. Find the opposite of -249 feet.
139. The temperature in a certain city at noon on a given day is 12°F . Find the opposite of 12°F .
140. The temperature in a certain city at noon on a given day is -7°F . Find the opposite of -7°F .
141. A certain stock gained $\frac{1}{8}$. Find the opposite of $\frac{1}{8}$.
142. A certain stock lost $\frac{5}{8}$. This can be represented by $-\frac{5}{8}$. Find the opposite of $-\frac{5}{8}$.
143. Gilley has a balance of \$243.77 in his checking account. Find the opposite of \$243.77.
144. Susanna wrote a check for \$24.95. This can be represented by $-\$24.95$. Find the opposite of $-\$24.95$.

Writing a Subtraction as an Equivalent Addition

For help working these types of problems, go back to Examples 21–22 in the Explain section of this lesson.

145. Write $45 - 38$ as an addition.
146. Write $-231 - 54$ as an addition.
147. Write $45 - (-73)$ as an addition.
148. Write $-320 - (-253)$ as an addition.
149. Write $2.78 - 9.07$ as an addition.
150. Write $-4.5998 - 38.972$ as an addition.
151. Write $3\frac{5}{7} - (-2\frac{1}{5})$ as an addition.
152. Write $-\frac{7}{8} - (-1\frac{5}{8})$ as an addition.
153. Write each subtraction as an addition: $15 - (-32) - 24$
154. Write each subtraction as an addition: $56 - 84 - (-31)$
155. Write each subtraction as an addition: $89 - 52 - 79 + 101 - 32$
156. Write each subtraction as an addition: $383 - 67 + 219 - (-423) - 41$
157. Write each subtraction as an addition: $3.54 - 7.89 - (-8.44) - 2.1$
158. Write each subtraction as an addition: $7.638 + 3.89 - 54.21 - (-2.33)$
159. Write each subtraction as an addition: $4\frac{4}{5} - \frac{3}{5} - (-2\frac{2}{5})$
160. Write each subtraction as an addition: $\frac{4}{7} + \frac{2}{3} - \frac{3}{8} - \frac{1}{6}$
161. The elevation of a certain town is 3500 feet. The elevation of another town is -24 feet. To help find the difference in the elevations of these two towns, you can do this subtraction: $3500 - (-24)$. Rewrite this subtraction as an addition.
162. A submarine starts at a depth of 475 feet. This is represented as -475 feet. It starts to surface but stops at a depth of 55 feet (or -55 feet). To help find the distance the submarine traveled towards the surface, you can do this subtraction: $-55 - (-475)$. Rewrite this subtraction as an addition.
163. The melting point of the element neon is -248.4°C . The melting point of sodium is 98°C . To find the difference between the melting point of neon and the melting point of sodium, you can do this subtraction: $-248.4 - 98$. Rewrite this subtraction as an addition.
164. The boiling point of methane is -161.7°C . The boiling point of octane is -125.7°C . To find the difference between the boiling point of methane and the boiling point of octane, you can do this subtraction: $-161.7 - 125.7$. Rewrite this subtraction as an addition.
165. The price of a certain stock loses $\$ \frac{3}{8}$ on Monday. At the close of business on Tuesday, the net loss of the price of the stock for Monday and Tuesday is $\$ \frac{1}{4}$. To find how much the stock lost on Tuesday, you can do this subtraction: $-\frac{1}{4} - (-\frac{3}{8})$.
- Rewrite this subtraction as an addition.

166. A certain stock loses $\$ \frac{7}{8}$ on Monday. At the close of business on Tuesday, the net gain of the price of the stock for Monday and

Tuesday is $\$ \frac{1}{8}$. To find how much the stock gained on Tuesday, you can do this subtraction: $\frac{1}{8} - \left(-\frac{7}{8}\right)$.

Rewrite this subtraction as an addition.

167. Joleen has a balance of \$134.98 in her checking account. She writes checks for \$42.70 and \$26.95. To find the current balance in her checking account, you can do these subtractions: $134.98 - 42.70 - 26.95$. Rewrite the subtractions as additions.

168. Lance has a balance of \$15.93 in his checking account. He writes checks for \$10.99 and \$11.78. To find the current balance in his checking account, you can do these subtractions: $15.93 - 10.99 - 11.78$. Rewrite the subtractions as additions.

Subtracting Signed Numbers

For help working these types of problems, go back to Examples 23–25 in the Explain section of this lesson.

169. Find: $25 - 76$

170. Find: $312 - (-41)$

171. Find: $-41 - 32$

172. Find: $-256 - (-433)$

173. Find: $-289 - 257$

174. Find: $317 - 210$

175. Find: $-6631 - (-5123)$

176. Find: $-2892 - (-8923)$

177. Find: $3.4 - 8.2$

178. Find: $7.901 - (-24.02)$

179. Find: $-73.091 - 34.507$

180. Find: $-43.92 - (-23.59)$

181. Find: $3\frac{4}{5} - 2\frac{3}{10}$

182. Find: $5\frac{3}{8} - \left(-2\frac{3}{4}\right)$

183. Find: $-\frac{8}{15} - \left(-2\frac{4}{5}\right)$

184. Find: $-3\frac{2}{3} - 7\frac{5}{6}$

185. Subtract the greater number from the lesser number: -10 and 7 .

186. Subtract the lesser number from the greater number: 76 and -4 .

187. A football player gets the ball 5 yards behind the line of scrimmage and is tackled 14 yards beyond the line of scrimmage. How far did the football player run? Hint: The line of scrimmage corresponds to 0 on the number line.

188. A golfer has a score of 1 over par which is $+1$ after nine holes of golf. On the tenth hole he scores 2 under par. What is his score after playing the tenth hole?

189. A submarine is at a depth of 24 feet below sea level. A ship flying overhead is at an altitude of 315 feet. How far is the airplane from the submarine?
190. A certain city is at an elevation of 375 feet. Another city is at an elevation of -10 feet. What is the difference in the elevations between the city at the higher elevation and the city at the lower evaluation?
191. At sunrise, the temperature in a certain city was -15°F . At noon, the temperature in the city was -7°F . What is the difference between the temperature at noon and the temperature at sunrise?
192. The boiling point of methane is -161.7°C . The boiling point of propane is -42.1°C . What is the difference between the boiling point of propane and the boiling point of methane?

Subtracting More Than One Signed Number

For help working these types of problems, go back to Examples 26–27 in the Explain section of this lesson.

193. Find: $32 - (-42) - 26$
194. Find: $47 - 93 - (-25)$
195. Find: $-15 - (-4) - 35 + 10$
196. Find: $-53 - 21 + 78 - (-62)$
197. Find: $146 - (-532) - 355 + 200$
198. Find: $-673 - 429 - (-557) + 217$
199. Find: $-10 - 16 - 27 - 82$
200. Find: $-345 - (-211) - (-42) - (-76)$
201. Find: $3.47 - 1.08 - 2.32$
202. Find: $5.409 - (-2.345) - 10.931$
203. Find: $-89.431 - (-54.762) - 21.207 + 32.04$
204. Find: $-201.9 - (-43.35) - (-76.003) - (-102.3)$
205. Find: $4\frac{2}{3} - 7 - (-3\frac{1}{3})$
206. Find: $7\frac{3}{5} - (-3\frac{2}{15}) - 2\frac{3}{10}$
207. Find: $8\frac{3}{16} - 9\frac{5}{8} - (-2\frac{3}{4}) - 11\frac{1}{4}$
208. Find: $-5\frac{2}{3} - 6\frac{5}{6} - (-7\frac{3}{4}) + 2\frac{1}{3}$
209. What is the difference between 9 less than -5 and 4 less than 10? To answer the question do this subtraction: $(-5 - 9) - (10 - 4)$. Perform the subtractions inside the parentheses first.
210. What is the difference between -5 less -8 and 15 less than -2 ? To answer the question do this subtraction: $[-5 - (-8)] - (-2 - 15)$. Perform the subtractions inside the grouping symbols first.
211. Fitzgerald has a balance of \$23.58 in his checking account. Find the balance in his checking account after he writes checks for \$18.76 and \$54.90 and makes a deposit of \$78.00.

212. Chaney has a balance of \$179.86 in her checking account. Find the balance in her checking account after she writes checks for \$32.75, \$19.90, and \$150.00.
213. On four consecutive days, the price of a certain stock gained $\$ \frac{1}{2}$, lost $\$ \frac{5}{8}$, lost $\$ \frac{1}{4}$, and gained $\$ \frac{3}{4}$. Find the net gain or loss in the price of the stock.
214. On four consecutive days, the price of a certain stock lost $\$ \frac{1}{8}$, lost $\$ \frac{3}{8}$, gained $\$ \frac{3}{4}$ and lost $\$ \frac{7}{8}$. Find the net gain or loss in the price of the stock.
215. Par for a round of 18 holes on a certain golf course is 79. In a three-day tournament, Larry plays one round of golf each day. On the first day, Larry scored 2 under par. The second day, he scored 1 over par. Larry's score the third day was 4 under par. What was Larry's total score for the three rounds?
216. In the first half of a football game, a fullback carried the ball five times. He gained 5 yards, lost 2 yards, gained 15 yards, lost 9 yards, and gained 1 yard. What was his net yardage for those five plays?

Solving an Equation

For help working these types of problems, go back to Examples 28–29 in the Explain section of this lesson.

217. Solve for x : $x + 4 = 8$
218. Solve for x : $x + 5 = 2$
219. Solve for x : $x + 8 = -2$
220. Solve for x : $x + 3 = -12$
221. Solve for x : $x - 25 = 41$
222. Solve for x : $x - 71 = 12$
223. Solve for x : $x - 241 = -198$
224. Solve for x : $x - 397 = -714$
225. Solve for x : $x + 0.01 = 3.055$
226. Solve for x : $x - 2.456 = 1.596$
227. Solve for x : $x + 34.002 = -23.415$
228. Solve for x : $x - 201.99 = -412.01$
229. Solve for x : $x + \frac{3}{8} = 2\frac{3}{4}$
230. Solve for x : $x - 5\frac{3}{7} = -2\frac{4}{7}$
231. Solve for x : $x - 3\frac{7}{12} = 7\frac{5}{6}$
232. Solve for x : $x + 1\frac{4}{5} = -3\frac{7}{15}$
233. Twenty less than a number is -14 . To find the number, solve this equation for x : $x - 20 = -14$.
234. Fourteen more than a number is -13 . To find the number, solve this equation for x : $x + 14 = -13$.
235. The difference between the boiling point of octane and the boiling point of butane is 126.2°C . The boiling point of butane is -0.5°C . To find the boiling point of octane, solve this equation for x : $x - (-0.5) = 126.2$.

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236. At noon, the temperature in a certain city was -2°F . This was 10°F warmer than the previous day's temperature at noon. To find the previous day's temperature at noon, solve this equation for x : $x + 10 = -2$
237. A submarine dives 245 feet to a depth of 678 feet below sea level. To find its depth before it dove, solve this equation for x :
 $x - 245 = -678$.
238. An airplane takes off from an airport at an elevation of -34 feet. After ascending 6034 feet, it reaches its cruising altitude. To find the cruising altitude of the airplane, solve this equation for x : $x - 6034 = -34$.
239. After writing a check for \$102.45, the balance in Sonja's checking account is \$23.67. To help find the balance in Sonja's checking account before she wrote the check, solve this equation for x : $x - 102.45 = 23.67$.
240. After making a deposit for \$300.00, the balance in Tray's checking account is \$199.43. To help find the balance in Tray's checking account before he made the deposit, solve this equation for x : $x + 300 = 199.43$.

Take this Practice Test to prepare for the final quiz in the Evaluate module of the computer.

Practice Test

1. Choose the number below that has the greatest value.

$$|-34| \qquad -42 \qquad 27 \qquad |12|$$

2. On a cold morning, the temperature at sunrise was -22° . By noon, the temperature had increased by 15° . To help find the temperature at noon, do this addition.

$$-22 + 15 = \underline{\hspace{2cm}}$$

3. When Barbara's checking account balance fell below zero, to $-\$23.56$, the bank charged her a penalty of \$12.

To help find Barbara's balance after the penalty, do the addition below.

$$-23.56 + (-12) = \underline{\hspace{2cm}}$$

4. Do this addition: $\frac{3}{4} + \left(-\frac{2}{3}\right) + \left(-\frac{1}{4}\right) + \frac{11}{12}$

5. Choose the expression below that is the same as: $345 - (-2589)$

$$-345 + 2589 \qquad 345 + 2589 \qquad 2589 - 345 \qquad 345 - 2589$$

6. Find: $-37.91 - (46.74)$

7. Find: $76 - (-102) - 37$

8. Solve this equation for x : $x + 36 = -36$
 $x = \underline{\hspace{2cm}}$

