

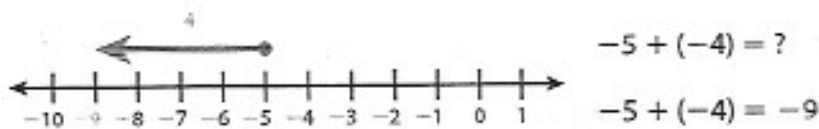
Add Positive and Negative Integers

Study the example problem showing how to add positive and negative integers. Then solve problems 1–8.

Example

Graph each situation on a number line. Then, model each situation with an equation.

- Jordan already owes \$5 to Kiara and borrows \$4 from Don. How much money does Jordan have?

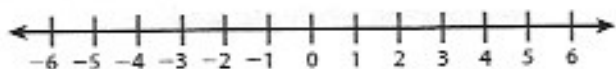


- Micah has \$4 and owes Ben \$7.

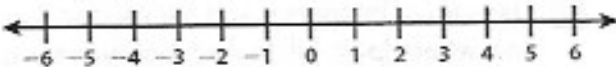


1 Complete the equation and model each sum on a number line.

a. $\square + 4 = 0$



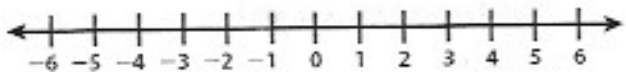
b. $-5 + \square = 0$



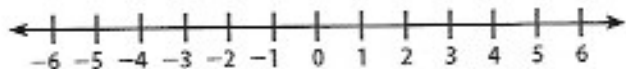
- c. When will the sum of two numbers be zero?

2 In the first box of each equation, write an example of an integer that will result in the sum described. Then write the sum. Model each sum on a number line.

a. positive sum: $-5 + \square = \square$



b. negative sum: $-4 + \square = \square$



Solve.

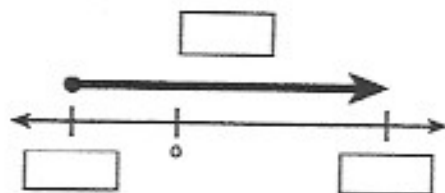
- 3 Explain how you can use absolute value to tell whether the sum of two integers is positive or negative.

- 4 An elevator is two floors below ground level and goes up 5 floors. Write an addition equation that models the location of the elevator relative to ground level. What integer represents the new location?

- 5 One morning, the temperature was -5°F . By noon, the temperature had increased 12 degrees. What was the temperature at noon? Use a model to explain your answer.

- 6 A lobster fisherman moves a lobster trap from 20 feet below sea level to a location that is 15 feet deeper. Draw a number line and write an addition equation that models this situation. What integer represents the new location relative to sea level?

- 7 The sum of integers p and q is modeled on a number line, where $|p| < |q|$. In each box, write p , q , or $p + q$. Then write an addition equation using integers that could represent p , q , and $p + q$.



- 8 Show how the model in problem 7 would change if $|p| > |q|$. Draw the model, labeling p , q , and $p + q$. Then write an addition equation using integers that could represent p , q , and $p + q$.

Lesson 1 Quiz continued

- 4** Which situations can be represented by the expression $-75 + 75$?

Choose all that apply.

- A Last night Sarah read 75 fewer pages than the night before. She reads 75 pages tonight.
- B A diver is 75 feet below the surface of the water and then comes up to the surface.
- C Peter adds 75 milliliters of water to a test tube containing 75 milliliters.
- D Amber owes the phone company \$75 and she pays them \$75.

- 5** Decide if each statement is true for all values of x .

Choose *Yes* or *No* for each statement.

- a. If the distance from 0 to x on a number line is equal to 2, then $-2 + x = 0$. Yes No
- b. If the distance from 0 to x on a number line is less than 2, then $-2 + x$ is negative. Yes No
- c. If the distance from 0 to x on a number line is greater than 2, then $-2 + x$ is positive. Yes No
- d. If the distance from 0 to x on a number line is greater than 0, then $-2 + x$ is positive. Yes No



Subtract Positive and Negative Integers

Study the example problem showing how to subtract two integers. Then solve problems 1–4.

Example

What is the difference between an elevation of -4 feet and an elevation of 8 feet?

Find the difference by subtracting: $8 - (-4)$.

Write the subtraction as an addition problem: $8 + 4$.

Model the addition problem on a number line.

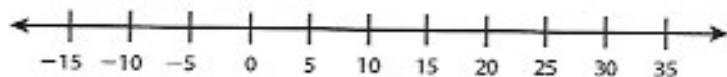
The difference in the elevations is 12 feet.



- 1** Marcie is playing a board game with a friend. She needs 20 points to win. She currently has -10 points. She wants to know the difference between the number of points she now has and the number of points she needs.

- a. Write a subtraction problem to represent the situation. Then write the subtraction problem as an addition problem.

- b. Model the addition problem on the number line.

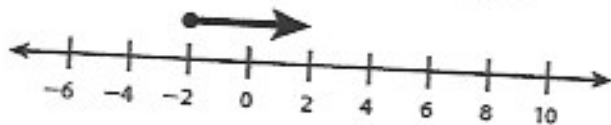


- c. What is the difference between the number of points she needs to win and the number of points she now has?

Solve.

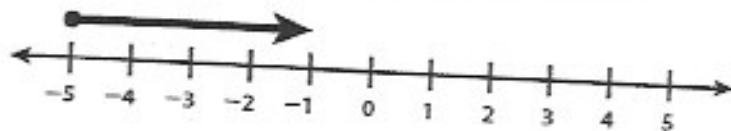
- 2 Jessie uses the number line below to help write $-2 + (-4)$ as a subtraction problem.

- a. What is wrong with Jessie's number line?



- b. Write the subtraction problem and the answer.
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- 3 Use the number line below to solve the problems.



- a. What is the distance between -5 and -1 on the number line? _____
- b. What is $|-5 - (-1)|$? _____
- c. What do you notice about the absolute value of the difference between the two numbers?
-
-

- 4 What number must be subtracted from -5 for the difference to be -2 ? Explain your answer. Include a number line in your explanation.
-
-
-
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Lesson 2 Quiz *continued*

- 4** Alana makes and sells homemade bracelets. She made a profit of \$65 last week. This week, she donated some bracelets to charity. Her profit at the end of this week can be represented by $-\$25$.

Part A

Write a subtraction expression and an addition expression to represent Alana's total profit for the two weeks combined.

Subtraction expression: _____

Addition expression: _____

Part B

What is the difference between last week's profit and this week's profit?

Show your work.

Answer: \$ _____

- 5** Laura says that the distance between $(4, -2)$ and $(4, -7)$ in the coordinate plane is equal to $|-2 - (-7)|$ units.

Ryan says that the distance between the points $(2, 3)$ and $(-9, 3)$ in the coordinate plane is equal to $|2 + 9|$ units.

Is either Laura or Ryan correct? Explain.



Add and Subtract Positive and Negative Integers

Solve the problems.

- 1 The element bromine turns into a liquid at -7°C , and it turns into a gas at 59°C . From the temperature at which bromine becomes a liquid, by how many degrees must the temperature change for it to turn into a gas?

- A -66°C C 52°C
 B -52°C D 66°C

Johnathan chose C as his answer. How did he get that answer?

Should you add or subtract?



- 2 Lamont keeps track of his math grades by recording them in a table. He wants to keep an average of 90, so he also lists the amount that each grade is above or below 90.

- a. Complete the table.

Test	1	2	3	4	5	6
Grade	83	94	79		96	
Above/Below 90	-7	4		7		-3

- b. Use the numbers in the *Above/Below 90* row to find out whether Lamont's average is above or below 90.

Show your work.

Solution: _____

- c. What grade does Lamont need to get on the next test to have an average of exactly 90? Explain your answer.

You may want to group the positive numbers and the negative numbers.



Solve.

- 3 Which expressions are equivalent to -9 ? Select all that are correct.

- A $8 - 8 + 9$
- B $3 - (-6) + (-18)$
- C $-1 + 7 - (-3)$
- D $4 - 5 - 8$

Recall how to write a subtraction problem as an addition problem.



- 4 Tell whether each equation is *True* or *False*.

- a. $-4 + (-7) = 11$ True False
- b. $5 + (-4) = -5 + 4$ True False
- c. $-10 + 7 = 7 - 10$ True False
- d. $14 + (-3) = 10 + 1$ True False

What should be your first step?



- 5 A duck is sitting on a ledge that is 11 feet above the surface of a pond. The duck dives 27 feet straight down to get food at the bottom of the pond. Which expression represents the position of the bottom of the pond, in feet, relative to its surface level?

- A $27 + 11$ C $11 - (-27)$
- B $27 + (-11)$ D $11 + (-27)$

What does a negative value mean in this situation?



- 6 Which of the following are negative integers? Select all that are correct.

- A the sum of two positive integers
- B the sum of two negative integers
- C the difference of a positive integer and an integer that is greater than it
- D the difference of a negative integer and an integer that is greater than it but that is not its opposite

You may want to draw a number line and try sample numbers.

