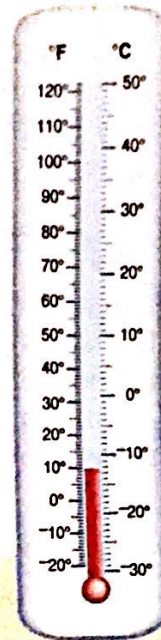


Lesson 5

Audio Tutor 1/32 Listen and Understand

Subtract Integers

Objective Find the difference of two integers.



Learn About It

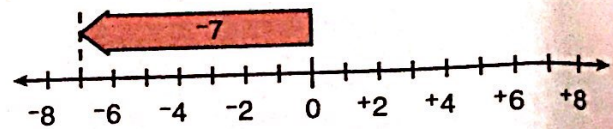
Addition and subtraction are inverse operations. Just as you can use a number line or a rule to add integers, you can use a number line or a rule to subtract integers.

Find $-7 - -10$.

Different Ways to Find $-7 - -10$

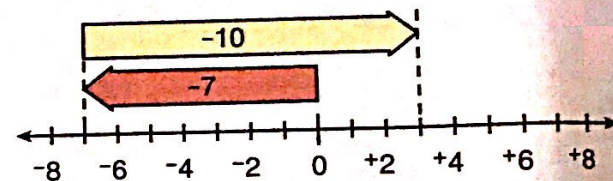
Way 1 Use a number line.

STEP 1 Begin at 0. Move left 7 units to show -7 .



STEP 2 To add -10 , you would move left 10 units. To subtract -10 , you move right 10 units.

The point at which you stop is the difference $-7 - -10$.



$$-7 - -10 = +3$$

Way 2 Use a rule.

$$-7 - -10$$

$$-7 + +10 = +3$$

Rule:

Subtracting an integer is the same as adding its opposite.

Solution: $-7 - -10 = -7 + +10 = +3$.

Guided Practice

Subtract. Use a number line to help.

1. $-10 - +7$
2. $+8 - -3$
3. $-3 - -2$
4. $+5 - +10$
5. $-4 - 0$
6. $0 - +7$
7. $-7 - -2$
8. $-4 - +8$

Ask Yourself

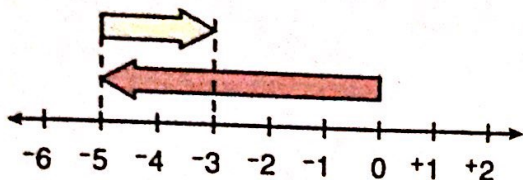
- Did I change the sign of the second integer and add?

Explain Your Thinking ► How are adding and subtracting integers related?

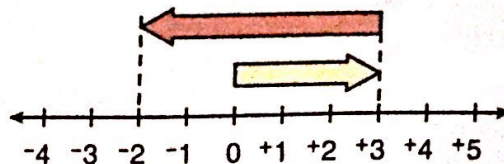
Practice and Problem Solving

Write a subtraction sentence for each.

9.



10.



Complete each related equation.

11. $+9 - +2 = \square$

12. $-9 - +10 = \square$

13. $-5 - +4 = \square$

$+9 + -2 = \square$

$-9 + -10 = \square$

$-5 + -4 = \square$

Subtract. Use a number line or the rule.

14. $+11 - -4$

15. $+3 - +10$

16. $0 - +2$

17. $0 - -13$

18. $-4 - +8$

19. $-5 - -5$

20. $+4 - +1$

21. $-4 - +1$

22. $-11 - +14$

23. $-17 - -9$

24. $-9 - +5$

25. $-7 - -8$

X Algebra • Equations Use mental math to solve for n .

26. $+4 - n = -4$

27. $+12 - n = +5$

28. $-7 - n = -8$

Solve.

29. Phil read his thermometer as 10°F . The radio meteorologist said wind chill made it feel like -11°F . What is the difference in temperature?

31. **Reasoning** Two integers have a sum of -2 . The difference of the lesser integer and the greater integer is -2 . The sum of the absolute values of the integers is 2. What are the integers?

30. Geoff owed Carola \$14. He recorded this in his notebook as $-\$14$. Then he paid Carola \$9 of his debt. How can Geoff record how much he owes Carola now?

32. **Create and Solve** Choose an integer greater than 100. Choose an integer less than -10 . Write a situation that can be represented by the positive integer subtracted from the negative integer.

Mixed Review and Test Prep

Open Response

Multiply. Express each product in simplest form. (Ch. 6 Lessons 2 and 3)

33. $\frac{2}{5} \times \frac{1}{6}$

34. $\frac{3}{11} \times \frac{6}{7}$

35. $2\frac{1}{2} \times 3$

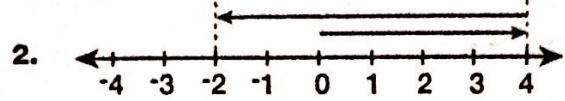
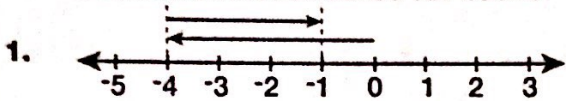
36. $\frac{1}{2} \times 3\frac{4}{5}$

37. At 5 P.M., the air temperature was -5°C . At 10 P.M. it had decreased by 9° . What was the air temperature at 10 P.M.? Explain how you solved the problem. (Ch. 11, Lesson 5)

Extra Practice See page 299, Set D.

Subtract Integers

Write a subtraction sentence for each.



Complete each related equation.

3. $+6 - +5 =$ _____
 $+6 + -5 =$ _____

4. $-9 - -4 =$ _____
 $-9 + +4 =$ _____

5. $-2 - -5 =$ _____
 $-2 + +5 =$ _____

6. $+6 - +8 =$ _____
 $+6 + -8 =$ _____

Subtract. Use a number line or the rule.

- | | | |
|-----------------------|-----------------------|-----------------------|
| 7. $-9 - +4$ _____ | 8. $+8 - -12$ _____ | 9. $+9 - +7$ _____ |
| 10. $+8 - +17$ _____ | 11. $-20 - -15$ _____ | 12. $+12 - +15$ _____ |
| 13. $-14 - -3$ _____ | 14. $+17 - -24$ _____ | 15. $-19 - +17$ _____ |
| 16. $+8 - -9$ _____ | 17. $+15 - +20$ _____ | 18. $+17 - -23$ _____ |
| 19. $+21 - +24$ _____ | 20. $-16 - +23$ _____ | 21. $-23 - -13$ _____ |
| 22. $+2 - +3$ _____ | 23. $+24 - -18$ _____ | 24. $-14 - -14$ _____ |
| 25. $+2 - -9$ _____ | 26. $+17 - +23$ _____ | 27. $-14 - -2$ _____ |

Algebra • Equations Use mental math to solve for n .

- | | | |
|-------------------------|-------------------------|-------------------------|
| 28. $+3 - n = -2$ _____ | 29. $+8 - n = +2$ _____ | 30. $-3 - n = +1$ _____ |
| 31. $-4 - n = +4$ _____ | 32. $-2 - n = +5$ _____ | 33. $-6 - n = -4$ _____ |

Test Prep

34. What is $-34 - -73$?
- A -107 C $+39$
 B -39 D $+107$
35. Matt owed Cindy \$12. He later paid her back \$5. How could Matt have recorded the first debt, and what he owed Cindy after the \$5 payment?

Subtract Integers

Ways of Subtracting Integers

$-4 - +9 = \square$

$-4 - -9 = \square$

$+4 - -9 = \square$

$+4 - +9 = \square$

$-4 + -9 = -13$

$-4 + +9 = +5$

$+4 + +9 = +13$

$+4 + -9 = -5$

Complete each related equation.

1. $-9 - +6 = \underline{\hspace{2cm}}$

2. $-5 - -3 = \underline{\hspace{2cm}}$

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

$-9 + -6 = \underline{\hspace{2cm}}$

$-5 + +3 = \underline{\hspace{2cm}}$

$+4 + -2 = \underline{\hspace{2cm}}$

Subtract. Use a number line or the rule.

4. $0 - -7$

5. $+11 - -5$

6. $-9 - +3$

7. $+6 - +4$

8. $-13 - +5$

9. $+7 - 0$

10. $-6 - -8$

11. $-11 - +13$

12. $+3 - -1$

13. $+11 - +4$

14. $-7 - -9$

15. $-8 - +8$

Problem Solving

Show Your Work

16. Robin's checkbook balance was \$12. She deposited \$10, wrote a check for \$22, and deposited \$5. What was her balance after these transactions?

For a while the high, bare cliffs of red earth stood up behind the wagon. But they were almost hidden behind hills and trees when Pet and Patty stopped to drink from the creek.

The rushing sound of the water filled the still air. All along the creek banks the trees hung over it and made it dark with shadows. In the middle it ran swiftly, sparkling silver and blue.

"This creek's pretty high," Pa said. "But I guess we can make it all right. You can see this is a ford, by the old wheel ruts. What do you say, Caroline?"

"Whatever you say, Charles," Ma answered.

Pet and Patty lifted their wet noses. They pricked their ears forward, looking at the creek; then they pricked them backward to hear what Pa would say. They sighed and laid their soft noses together to whisper to each other. A little way upstream, Jack was lapping the water with his red tongue.



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“I’ll tie down the wagon-cover,” Pa said. He climbed down from the seat, unrolled the canvas sides and tied them firmly to the wagon box. Then he pulled the rope at the back, so that the canvas puckered together in the middle, leaving only a tiny round hole, too small to see through.

Mary huddled down on the bed. She did not like fords; she was afraid of the rushing water. But Laura was excited; she liked the splashing. Pa climbed to the seat, saying, “They may have to swim, out there in the middle. But we’ll make it all right, Caroline.”

Laura thought of Jack and said, “I wish Jack could ride in the wagon, Pa.”



Pa did not answer. He gathered the reins tightly in his hands. Ma said "Jack can swim, Laura. He will be all right."

The wagon went forward softly in mud. Water began to splash against the wheels. The splashing grew louder. The wagon shook as the noisy water struck at it. Then all at once the wagon lifted and balanced and swayed. It was a lovely feeling.

The noise stopped, and Ma said, sharply, "Lie down, girls!"

Quick as a flash, Mary and Laura dropped flat on the bed. When Ma spoke like that, they did as they were told. Ma's arm pulled a smothering blanket over them, heads and all.

"Be still, just as you are. Don't move!" she said.

Mary did not move; she was trembling and still.



But Laura could not help wriggling a little bit. She did so want to see what was happening. She could feel the wagon swaying and turning; the splashing was noisy again, and again it died away. Then Pa's voice frightened Laura. It said, "Take them, Caroline!"

The wagon lurched; there was a sudden heavy splash beside it. Laura sat straight up and clawed the blanket from her head.

Pa was gone. Ma sat alone, holding tight to the reins with both hands. Mary hid her face in the blanket again, but Laura rose up farther. She couldn't see the creek bank. She couldn't see anything in front of the wagon but water rushing at it. And in the water, three heads; Pet's head and Patty's head and Pa's small, wet head. Pa's fist in the water was holding tight to Pet's bridle.

