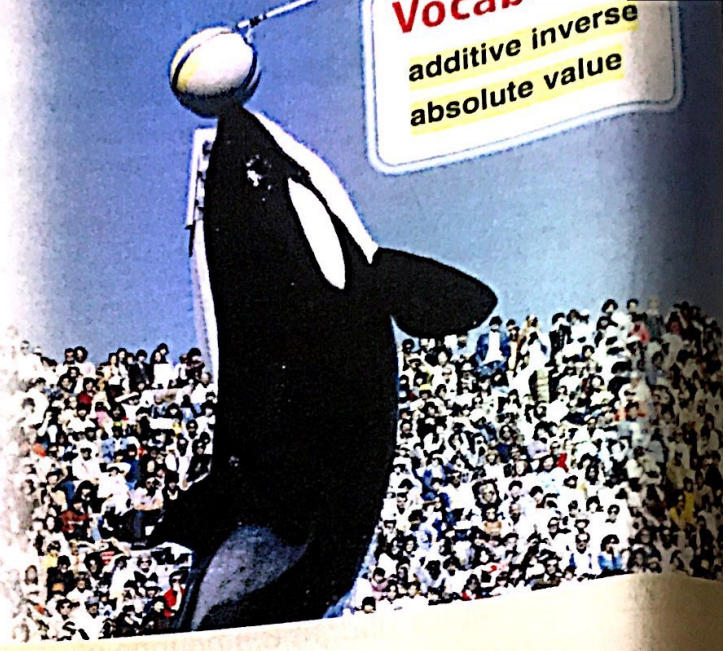
Hands On Lesson 4

Audio Tutor 1/31 Listen and Understand

Add Integers

Objective Find the sum of two integers.



Learn About It

Lynn measures an orca's performance on a point system. The orca scores 5 points for catching a ball then loses 3 points for missing her cue. What was her score during this routine?

You can use counters or a number line to add integers.

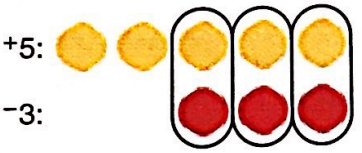
Add. $^{+}5 + {}^{-}3 = n$

Different Ways to Add $^{+}5 + {}^{-}3$

Way 1 Use counters.

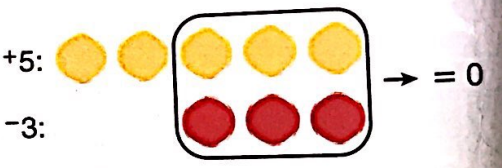
STEP 1 Show $^{+}5$ and $^{-}3$ with counters.

STEP 2 Pair a yellow counter with a red counter until you have only one color left.



Each yellow–red pair represents $^{+}1 + {}^{-}1$, or 0.

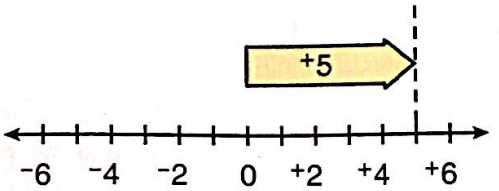
STEP 3 Remove the zero pairs.



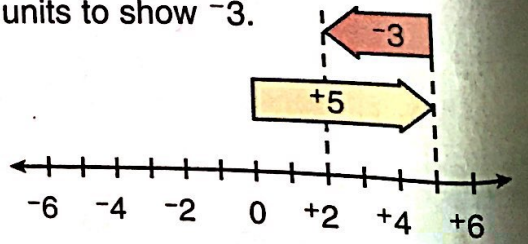
There are 2 yellow counters left.
So $^{+}5 + {}^{-}3 = {}^{+}2$.

Way 2 Use a number line.

STEP 1 Begin at 0. Move right 5 units to show $^{+}5$.



STEP 2 Then, starting at $^{+}5$, move left 3 units to show $^{-}3$.

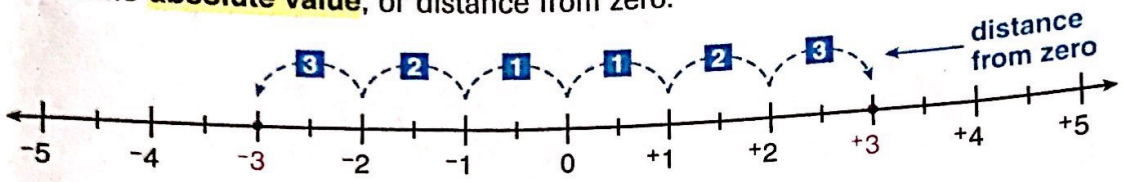


The point at which you stop is the sum $^{+}5 + {}^{-}3$.

$^{+}5 + {}^{-}3 = {}^{+}2$

Solution: The orca scored $^{+}2$ points.

The **additive inverse** of an integer is its opposite. The sum of an integer and its additive inverse is always 0. Additive inverses have the same **absolute value**, or distance from zero.



The absolute value of both $^{-}3$ and $^{+}3$ is 3 because both are 3 units from zero.

If you are adding two integers that have different signs, you can subtract the absolute values and use a rule to decide on the sign of the sum.

Rule:

The sum of a positive and a negative integer will have the same sign as the integer with the greater absolute value.

Find $^{+}4 + {}^{-}7$.

STEP 1 Subtract the lesser absolute value from the greater.

$^{+}4 + {}^{-}7 = n$

The absolute value of $^{+}4$ is 4.

The absolute value of $^{-}7$ is 7.

$7 - 4 = 3$

STEP 2 Use the rule to decide if the sum will be positive or negative.

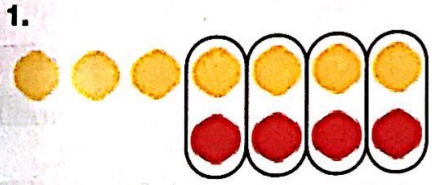
Since $^{-}7$ has a greater absolute value than $^{+}4$, the sum will be negative.

$^{+}4 + {}^{-}7 = {}^{-}3$

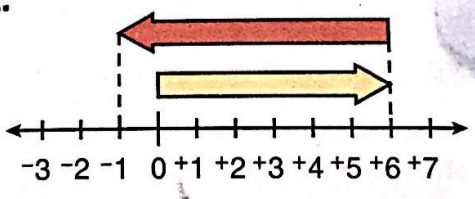
Guided Practice

Write the addition problems shown by the models.

1.



2.



Ask Yourself

- Did I use the correct sign for the sum?

Add. Use counters or a number line to help.

3. $^{-}8 + {}^{+}7$

4. $^{-}11 + {}^{-}3$

5. $^{+}5 + {}^{+}8$

6. $^{-}9 + {}^{+}9$

Write the missing addend.

7. $^{+}9 + \square = {}^{-}4$

8. $^{-}2 + \square = {}^{+}6$

9. $\square + {}^{-}3 = {}^{+}7$

10. $\square + {}^{+}6 = 0$

Explain Your Thinking When is the sum of a positive integer and a negative integer positive?

Go On

Practice and Problem Solving

Add. Use counters or a number line to help.

11. $^{-}1 + {}^{-}2$
12. $^{+}8 + {}^{-}5$
13. $^{-}3 + {}^{-}2$
14. $^{-}7 + {}^{+}11$
15. $^{-}5 + {}^{+}9$
16. $^{-}16 + 0$
17. $^{+}4 + {}^{-}3$
18. $^{-}13 + {}^{-}1$

Add. Use the rule.

19. $^{+}10 + {}^{-}11$
20. $^{+}11 + {}^{+}10$
21. $^{-}17 + {}^{+}4$
22. $^{-}21 + {}^{+}22$
23. $^{+}19 + {}^{-}1$
24. $^{+}17 + {}^{-}17$
25. $^{-}11 + 0$
26. $^{-}3 + {}^{-}5$

Mental Math **Write the missing addend.**

27. $^{-}10 + \square = {}^{+}2$
28. $\square + {}^{+}7 = {}^{-}11$
29. $^{-}2 + \square = {}^{-}2$
30. $\square + {}^{-}8 = {}^{-}10$
31. $^{+}13 + \square = {}^{+}6$
32. $\square + {}^{-}1 = {}^{+}8$
33. $\square + {}^{+}5 = {}^{-}5$
34. $0 + \square = {}^{-}3$
35. $\square + {}^{-}6 = {}^{+}21$
36. $^{+}7 + \square = {}^{+}14$
37. $^{-}3 + \square = {}^{+}4$
38. $\square + {}^{-}5 = {}^{-}18$

Algebra • Functions

Complete each table by following the rule.

39. **Rule: Add $^{+}8$**

Input	Output
$^{-}6$	
$^{+}9$	
$^{-}13$	

40. **Rule: Add $^{-}7$**

Input	Output
$^{+}15$	
$^{-}6$	
$^{+}3$	

41. **Rule: Add $^{-}4$**

Input	Output
$^{+}10$	
$^{+}2$	
$^{-}1$	

Choose a Computation Method

Mental Math • Estimation • Paper and Pencil • Calculator

Solve. Tell which method you chose.

42. Two dolphins jumped through a ring 10 feet above the water. Then they turned and dove 26 feet below that height. How many feet below the surface did the dives take them?

43. **Analyze** A seal dives to a depth of 35 feet and then resurfaces. On its next dive, the seal dives 10 feet deeper and resurfaces. How many feet will the seal have traveled during the two dives?

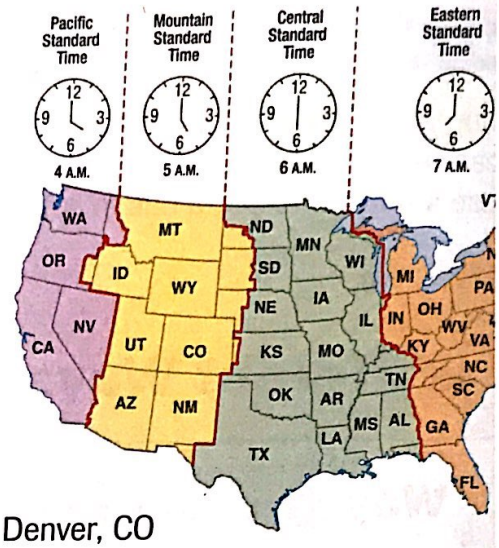
44. A sea lion dove from a rock 12 feet above sea level to a reef 45 feet below that height. It then dove another 14 feet to a boulder 9 feet off the bottom. What is the elevation at the bottom?

Extra Practice See page 299, Set C.

Problem So

Real World Connection
Time Zones

The system of time zones, which is used over the world, is called Standard Time. As you travel *west* through the time zones in the Continental U.S., the time changes to one hour earlier ($^-1$) than the previous time. As you travel *east* through each time zone, the time changes to one hour later ($^+1$).



Use the map of time zones to answer each question.

1. If it is 3:30 P.M. in New Orleans, LA, what time is it in each of these cities?

   a. Indianapolis, IN **b.** Eugene, OR **c.** Denver, CO

2. A plane from St. Louis, MO, arrived in Los Angeles, CA, at 10:00 A.M. What time did it leave St. Louis if it takes $3\frac{1}{2}$ hours to fly to Los Angeles?

WEEKLY WR READER eduplace.com/map

Quick Chec

Check your understanding of Lessons 1–4.

If the number is an integer, write its opposite. If it is not, write *no.* (Lesson 1)

1. $^-0.2$ 2. $^+37$ 3. $^-2{,}130$

Compare. Write > or < for each ●. (Lesson 2)

4. $^+8$ ● $^+14$ 5. $^-3$ ● $^+7$ 6. $^-12$ ● $^-16$

Draw a diagram to solve. (Lesson 3)

7. On his scuba dive, Einar spent $\frac{2}{5}$ of the time exploring a wreck, 15 minutes looking at coral, and 30 minutes descending and ascending. How long did Einar's dive last?

Add. (Lesson 4)

8. $^-6 + ^+5$ 9. $^+7 + ^-9$ 10. $^+3 + ^-3$

Name _____ Date _____

Practice 11.4

Add Integers

Add. Use counters or a number line to help.

1. $^{+}3 + {}^{-}1$ _____
2. $^{-}1 + {}^{-}1$ _____
3. $^{+}2 + {}^{+}4$ _____
4. $^{+}3 + {}^{+}4$ _____
5. $^{+}4 + {}^{-}1$ _____
6. $^{+}4 + {}^{-}5$ _____

Add. Use the rule.

7. $^{+}18 + {}^{+}15$ _____
8. $^{-}19 + {}^{+}17$ _____
9. $^{-}23 + {}^{-}16$ _____
10. $^{+}24 + {}^{-}27$ _____
11. $^{-}14 + {}^{-}32$ _____
12. $^{-}24 + {}^{+}13$ _____
13. $^{+}32 + {}^{-}45$ _____
14. $^{-}17 + {}^{-}25$ _____
15. $^{+}36 + {}^{-}24$ _____

Mental Math **Write the missing addend.**

16. $^{-}22 + \square = {}^{-}27$ _____
17. $\square + {}^{+}2 = {}^{+}5$ _____
18. $\square + {}^{-}6 = {}^{-}3$ _____
19. $^{+}14 + \square = 0$ _____
20. $\square + {}^{+}4 = {}^{-}18$ _____
21. $^{+}27 + \square = {}^{-}1$ _____

Algebra • Functions **Complete each table by following the rule.**

22. **Rule: Add $^{+}9$**

Input	Output
$^{-}6$	
	$^{+}12$
$^{+}15$	

23. **Rule: Add $^{-}8$**

Input	Output
	$^{-}14$
$^{+}2$	
	$^{+}7$

Test Prep

24. What is $^{-}18 + {}^{+}22$?

A $^{-}40$ C $^{+}4$

B $^{-}4$ D $^{+}40$

25. How can you use a number line to find $^{-}8 + {}^{-}2$?

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Use with text pages 282–284.

Name _____ Date _____

Homework 11.4

Add Integers

Find $^{+}5 + {}^{-}8$.

Step 1: Subtract the lesser absolute value from the greater.
The absolute value of $^{-}5$ is 5. The absolute value of $^{-}8$ is 8.
$8 - 5 = 3$

Step 2: Use the rule to decide if the sum will be positive or negative.
Since $^{-}8$ has a greater absolute value than $^{+}5$, the sum will be negative.
$^{+}5 + {}^{-}8 = {}^{-}3$

Add. Use counters or a number line to help.

1. $^{-}6 + {}^{+}7$ _____
2. $^{-}4 + {}^{-}7$ _____
3. $^{+}9 + {}^{-}3$ _____
4. $^{-}2 + {}^{-}8$ _____
5. $^{+}5 + {}^{+}9$ _____
6. $^{-}6 + {}^{+}8$ _____
7. $^{-}15 + {}^{-}7$ _____
8. $^{-}12 + {}^{+}11$ _____

Add. Use the rule.

9. $0 + {}^{-}3$ _____
10. $^{+}14 + {}^{-}4$ _____
11. $^{-}13 + {}^{-}3$ _____
12. $^{+}9 + {}^{-}5$ _____
13. $^{-}15 + {}^{+}8$ _____
14. $^{+}6 + 0$ _____
15. $^{-}11 + {}^{-}7$ _____
16. $^{-}17 + {}^{+}9$ _____

Write the missing addend.

17. $^{-}5 +$ _____ $= {}^{-}2$
18. $0 +$ _____ $= {}^{-}12$
19. $^{+}4 +$ _____ $= {}^{-}3$
20. $^{-}6 +$ _____ $= {}^{-}2$

Problem Solving

Show Your Work

21. At 9 A.M., a thermometer read $-11°C$. At noon, the temperature had risen 3°. At 5 P.M., it had dropped 2°. What did the thermometer read at 5 P.M.?

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Use with text pages 282–284.