

Lesson 1

Integers

Objective Identify and use integers.

Vocabulary

- integers
- positive integers
- negative integers
- opposite numbers

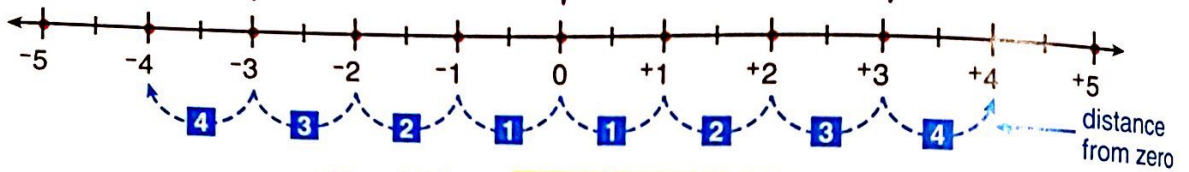
Learn About It

You can use a number line to display numbers called **integers**. The set of integers include the counting numbers, their opposites, and zero.

Negative integers are the opposites of positive integers, written with a raised minus sign (-).

Zero is an integer that is neither positive nor negative.

Positive integers are whole numbers greater than zero, written with or without a raised plus sign (+).



-4 and +4 are **opposite numbers**.
Opposite numbers are the same distance from zero.

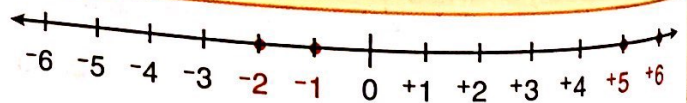
For a science project, Diarra measured the height of the water above or below sea level at her town dock. At which times was the water height above sea level? At which times was the water height below sea level?

Water Height

Time	Height (feet)
2:30 A.M.	+6
8:30 A.M.	-2
2:30 P.M.	+5
8:30 P.M.	-1

Use a number line to analyze the height compared to sea level.

STEP 1 Plot the heights on a number line.



STEP 2 Identify the times when the heights were above sea level.

The heights at 2:30 A.M. and 2:30 P.M. are **positive integers**. They are placed to the *right* of zero since the water was above sea level.

STEP 3 Identify the times when the heights were below sea level.

The heights at 8:30 A.M. and 8:30 P.M. are **negative integers**. They are placed to the *left* of zero since the water was below sea level.

Solution: At 2:30 A.M. and 2:30 P.M. the water heights were above sea level. At 8:30 A.M. and 8:30 P.M. the water heights were below sea level.

Guided Practice

If the number is an integer, write its opposite.
If it is not, write *no*.

1. +48 2. +2.6 3. -325 4. $\frac{7}{10}$

Ask Yourself

- When is a number an integer?
- Is the integer positive or negative?

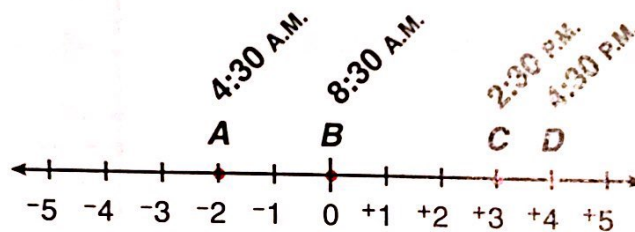
Explain Your Thinking ► What number is its own opposite?

Practice and Problem Solving

Write each number in word form. If the number is an integer, write its opposite. If it is not, write *no*.

5. -0.4 6. +71 7. -1,320 8. $-6\frac{1}{8}$ 9. +2
10. -29 11. -4.65 12. -625 13. +11 14. 0
15. $\frac{2}{3}$ 16. +870 17. -78 18. $+2\frac{1}{6}$ 19. +31

Use the number line for Problems 20 and 21.



Points A, B, C, and D represent changes in water height at sea level at four different times of day.

20. At which time had the water height not changed?
21. **Explain** At which time had the water height changed more, point A or C?
22. **Represent** What integer could you use to represent the phrase "5 feet below sea level"?
23. **Reasoning** In Problem 22, how did you determine whether the integer should be positive or negative?

Mixed Review and Test Prep

Open Response

Find the reciprocal of each. (Ch. 6, Lesson 4)

24. $\frac{1}{6}$ 25. $9\frac{7}{8}$
26. $\frac{3}{11}$ 27. 4

Multiple Choice

28. On a number line, which integer is the greatest distance from zero?
(Ch. 11, Lesson 1)
- A +1 C +3
B -2 D -4

Integers

Write each number in word form. If the number is an integer, write its opposite. If it is not, write *no*.

- | | |
|------------------------------|-------------------------------|
| 1. +5
_____ | 2. -2
_____ |
| 3. -6.9
_____ | 4. +7
_____ |
| 5. -12
_____ | 6. +120
_____ |
| 7. -15
_____ | 8. -1,000
_____ |
| 9. $-20\frac{2}{3}$
_____ | 10. +45.6
_____ |
| 11. -200
_____ | 12. +42
_____ |
| 13. -80
_____ | 14. $-40\frac{5}{8}$
_____ |
| 15. -18
_____ | 16. +12.45
_____ |
| 17. -37
_____ | 18. +49
_____ |
| 19. -63.4
_____ | 20. +98.6
_____ |

Test Prep

21. On a number line, which integer is the least distance from zero?
- A -8 C +2
B -3 D +7
22. What integer could you use to represent the phrase "a loss of \$3?"

Name _____ Date _____

Integers

- Positive integers** Whole numbers greater than zero
- Negative integers** Opposites of positive integers written with a raised minus sign ⁻
- Opposite numbers** Numbers such as -3 and $+3$ which are the same distance from zero.

Write each number in word form. If the number is an integer, write its opposite. If it is not, write *no*.

1. -6

2. $+4\frac{1}{2}$

3. $+8$

4. $+2.9$

5. -55

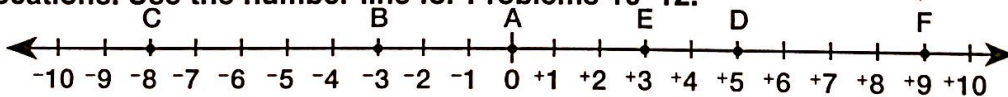
6. -6.8

7. $+38$

8. -7.4

9. -113

The number line represents the change in temperature in °F from 9 A.M. to 10 A.M. at several different locations. Use the number line for Problems 10–12.



10. At which location did the temperature increase the most?

11. Which location saw a greater change in temperature, C or E?

Problem Solving

Show Your Work

12. At location G, the temperature at 9 A.M. was 31°F . At 10 A.M. the temperature at location G was 25°F . Where would you place the letter G on the number line to represent this change in temperature?
