

Add and Subtract Integers

Teaching Skill 4

Objective Add and subtract integers.

Explain to students that adding and subtracting integers is best understood by thinking about absolute values, that is, the numbers without the negative signs.

Review with students how to add integers with the same signs. Ask: **If both signs are positive, what will be the sign of the sum?** (positive) **If both signs are negative, what will be the sign of the sum?** (negative) **Does it matter which number is larger?** (No) Work through Example 1.

Review with students how to add integers with opposite signs. Stress that the sign of the sum is determined by the larger number. Work through Example 2.

Review with students how to subtract integers. Ask: **What is the opposite of 5?** (-5) **What is the opposite of -8 ?** ($+8$) Work through Example 3.

Remind students that zero is neither positive nor negative. Ask: **When is the sum of two integers zero?** (when the numbers are opposites, e.g. 4 and -4)

Have students complete the exercises.

PRACTICE ON YOUR OWN

In exercises 1–12, students add and subtract integers.

CHECK

Determine that students know how to add and subtract integers.

Students who successfully complete the **Practice on Your Own** and **Check** are ready to move on to the next skill.

COMMON ERRORS

Students may confuse a subtraction sign with a negative sign.

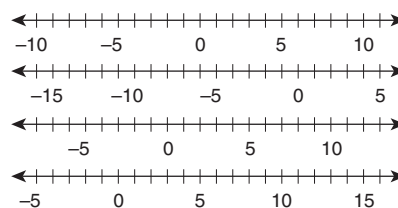
Students who made more than 2 errors in the **Practice on Your Own**, or who were not successful in the **Check** section, may benefit from the **Alternative Teaching Strategy**.

Alternative Teaching Strategy

Objective Add and subtract integers using a number line.

Materials needed: copies of the number lines shown below.

Some students may benefit from visualizing addition and subtraction using a number line. Give each student copies of the number lines. Tell students they are going to add integers using the number lines.



Write “ $3 + (-7)$ ” on the board. Direct students’ attention to the first number line.

Ask: **What do each of the tick marks represent on the number lines?** (one unit)

Instruct students to place a dot on the number 3. Ask: **If you were going to add 7 to 3, which direction would you move on the number line?** (right) **Since you are adding -7 instead, which way do you move?** (left) Instruct students to move 7 units to the left.

Ask: **What is the result?** (-4)



Next, have students use the second number line to add $-13 + 15$. Ask: **Where do you place your first dot?** (-13) **In which direction should you move?** (right) Make sure students arrive at 2 as an answer.

After students have a good understanding of adding integers, explain how to use the number line to subtract integers. Have students use the third and fourth number lines to practice the following: $8 - 14$ and $-2 - (-9)$. Make sure students know to move to the left when subtracting positive numbers and to the right when subtracting negative numbers (the opposite of when adding).

Have the students make up additional problems and draw their own number lines.

SKILL

4

Add and Subtract Integers

Adding Integers		Subtracting Integers
Same Signs	Opposite Signs	
Step 1: Ignore the signs. Step 2: Add the two numbers. Step 3: Add the sign of the larger number to the answer.	Step 1: Ignore the signs. Step 2: Subtract the smaller number from the larger number. Step 3: Add the sign of the larger number to the answer.	Instead of subtracting, add the opposite of the second number and then use the rules for adding integers.
Example 1: Add $-3 + (-9)$. $3 + 9 = 12$ Since both numbers are negative, the answer is also negative. $-3 + (-9) = -12$	Example 2: Add $7 + (-12)$. $12 - 7 = 5$ Since the larger number is negative ($12 > 7$), the answer is also negative. $7 + (-12) = -5$	Example 3: Subtract $6 - (-3)$. The opposite of -3 is 3. $6 + 3 = 9$

Practice on Your Own

Perform each indicated operation.

1. $-11 + 16$

2. $-22 + 18$

3. $15 - (-10)$

4. $-3 - 14$

5. $20 + (-9)$

6. $-6 + (-5)$

7. $6 - (-13)$

8. $8 - 14$

9. $-100 + 95$

10. $-7 + (-10)$

11. $-10 - (-10)$

12. $-25 - (-40)$

Check

Perform each indicated operation.

13. $-2 + 8$

14. $10 - 18$

15. $14 + (-21)$

16. $7 - (-3)$

17. $40 + (-35)$

18. $-17 - 4$

19. $-12 + 12$

20. $18 - (-13)$

Answer Key continued

SKILL 4 ANSWERS:

Practice on Your Own

- 5
 - 4
 - 25
 - 17
 - 11
 - 11
 - 19
 - 6
 - 5
 - 17
 - 0
 - 15
- Check**
- 6
 - 8
 - 7
 - 10
 - 5
 - 21
 - 0
 - 31

SKILL 5 ANSWERS:

Try These

- yes, $\frac{4}{5}$, yes
- yes, $\frac{2}{7}$, yes
- yes, $\frac{4}{8}$, no,
 $\frac{4 \div 4}{8 \div 4} = \frac{1}{2}$

Practice

- yes, $\frac{2}{6} + \frac{3}{6} = \frac{5}{6}$, yes

- yes, $\frac{4}{5} - \frac{3}{5} = \frac{1}{5}$, yes
- yes, $\frac{7}{10} + \frac{1}{10} = \frac{8}{10}$, no, $\frac{8 \div 2}{10 \div 2} = \frac{4}{5}$
- $\frac{3}{5}$, yes
- $\frac{4}{8}$, no, $\frac{4 \div 4}{8 \div 4} = \frac{1}{2}$
- $\frac{2}{10}$, no, $\frac{2 \div 2}{10 \div 2} = \frac{1}{5}$
- $\frac{2}{7}$
- $\frac{4}{9}$
- $\frac{1}{2}$
- 1

Check

- $\frac{1}{3}$
- $\frac{7}{8}$
- $\frac{1}{3}$
- $\frac{4}{5}$

SKILL 6 ANSWERS:

Try These

- 100
- 225, 275, 50
- \$100 = \$100
- $\frac{3}{10}$ or 30%

Practice

- \$400
- August
- July, September
- \$700
- $\frac{7}{25}$ or 28%
- $\frac{14}{25}$ or 56%
- less
- baths and dishwashers