

2-2 Adding and Subtracting

Rational Numbers *(Pages 73–78)*

The **absolute value** of a number is its distance from zero on a number line and is denoted by bars around a quantity. These absolute value bars can serve as grouping symbols. For example, $|-3 + 1| = 2$ since $-3 + 1 = -2$ and $|-2| = 2$.

Adding Integers	<ul style="list-style-type: none"> To add integers with the same sign, add their absolute values. The sum has the same sign as the integers. To add integers with different signs, subtract the lesser absolute value from the greater absolute value and give the result the same sign as the integer with the greater absolute value.
Additive Inverse Property	For every number a , $a + (-a) = 0$.
Subtracting Integers	To subtract a number, add its additive inverse or opposite . For any numbers a and b , $a - b = a + (-b)$.

Examples

a. Find $-9 + 16$.

The addends have different signs, so find the difference of their absolute values.

$$|16| - |-9| = 16 - 9 \text{ or } 7$$

Use the sign of 16 because it has the greater absolute value.

$$-9 + 16 = 7$$

b. Find $-3 - 4$.

Rewrite this problem as an addition problem.

$$-3 - 4 = -3 + (-4) \text{ To subtract 4, add } -4.$$

The addends have the same sign, so add and keep the same sign.

$$-3 - 4 = -7$$

Practice

1. State the additive inverse and absolute value of -111 .

Find each sum or difference.

2. $-100 + 82$

3. $-8 + 17$

4. $4 - (-12)$

5. $-10 - (-24)$

6. $|-23 - (-8)|$

7. $|-111 - (-56)|$

8. $-15 + (-3)$

9. $13 - (-2)$

Simplify each expression.

10. $6t + (-14t)$

11. $-7s + (-15s)$

12. $-8n - (-13n)$

13. $-16p - 4p$

Evaluate each expression if $x = -3$, $y = 4$, and $z = -6$.

14. $x + 12$

15. $y + z$

16. $|z| - y$

17. $-|z - 8|$

18. **Standardized Test Practice** Simplify $-12 - (-14)$.

A -2

B -16

C 16

D 2

Answers: 1. 111; 111 2. -18 3. 9 4. 16 5. 14 6. 15 7. 55 8. -18 9. 15 10. -8t 11. -22s 12. 5n 13. -20p 14. 9 15. -2 16. 2 17. -14 18. D