

Study Guide

Adding and Subtracting Integers

Use the following definitions, rules, and properties when adding or subtracting integers.

Definition, Rule, or Property		Example
Definition of Absolute Value	For any real number a : if $a > 0$, then $ a = a$, and if $a < 0$, then $ a = -a$. $ 0 = 0$	$ 2 = 2$ $ -2 = 2$
Adding Integers with the Same Sign	To add integers with the same sign, add their absolute values. Give the sum the same sign as the addends.	$3 + 2 = 5$ $-3 + (-2) = -5$
Adding Integers with Different Signs	To add integers with different signs, subtract the lesser absolute value from the greater absolute value. Give the result the same sign as the addend with the greater absolute value.	$-7 + 6 = -1$ $8 + (-4) = 4$
Additive Inverse Property	For every number a , $a + (-a) = 0$.	$-9 + 9 = 0$
Subtraction Rule	To subtract a number, add its additive inverse. For any numbers a and b , $a - b = a + (-b)$.	$8 - (-2) = 8 + 2$ $= 10$

You can use the distributive property and the addition and subtraction rules for integers to simplify expressions with like terms.

Example: Simplify $-6x - x + 9x$.

$$\begin{aligned} -6x - x + 9x &= -6x + (-1x) + 9x \\ &= [-6 + (-1) + 9]x \\ &= (-7 + 9)x \\ &= 2x \end{aligned}$$

Find each sum or difference.

1. $-17 + (-16)$

2. $107 + (-40)$

3. $75 + 86$

4. $11 - 41$

5. $15 - (-21)$

6. $-33 - (-17)$

7. $3m + (-15m) - 11m$

8. $-6a + 15a + (-11a)$

9. $-9y + 20y - (-6y)$

Evaluate each expression if $x = -4$, $y = 3$, and $z = -7$.

10. $456 + |z|$

11. $z + (-71) + |y|$

12. $-11 - |x|$

13. $31 - y - |x|$