

0.1 Integers & Signs

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Integers & Signs

Chapter 0 — Absolute Foundations

Show all work. Slow down on negative signs. When you feel stuck, rewrite subtraction as “add the opposite.”

Name: _____ Date: _____

Key Ideas — Integers & Signs

- **Integers** are whole numbers and their opposites: $\dots, -3, -2, -1, 0, 1, 2, 3, \dots$
- **Opposites:** a and $-a$ are opposites. Example: the opposite of 7 is -7 .
- **Absolute value:** $|a|$ is the distance from 0. Always nonnegative.
- **Subtracting:** $a - b = a + (-b)$ (subtracting is adding the opposite).
- **Sign rules:**
 - $(-)(-) = (+)$ and $(+)(-) = (-)$ and $(-)(+) = (-)$
 - Same signs \Rightarrow add magnitudes and keep the sign.
 - Different signs \Rightarrow subtract magnitudes and keep the sign of the larger magnitude.
- **Distributing negatives:**
$$-(a + b) = -a - b \quad \text{and} \quad -(a - b) = -a + b.$$

Quick Examples (read, then try the practice)

Example 1. Rewrite subtraction as addition:

$$6 - (-4) = 6 + 4 = 10.$$

Example 2. Different signs (subtract magnitudes):

$$-12 + 5 = -(12 - 5) = -7.$$

Example 3. Distribute a negative:

$$-(3x - 8) = -3x + 8.$$

Example 4. Combine like terms carefully:

$$-2x + 7x - (x - 5) = 5x - x + 5 = 4x + 5.$$

Practice A — Integer Operations

Compute. (No calculators.)

1. $7 + (-3) =$

2. $-8 + (-6) =$

3. $-15 + 9 =$

4. $12 - 19 =$

5. $-4 - 11 =$

6. $-13 - (-5) =$

7. $18 - (-7) =$

$$8. (-6)(-5) =$$

$$9. (9)(-4) =$$

$$10. \frac{-42}{6} =$$

$$11. \frac{-36}{-9} =$$

$$12. |-17| =$$

Practice B — Decode the Signs

Rewrite each expression to make the signs clearer, then simplify.

$$1. \ 10 - (-3) + (-2)$$

$$2. \ -5 - (-8) - 4$$

$$3. \ -12 + 6 - (-9)$$

$$4. \ 3 - 7 + (-11)$$

$$5. \ -20 - (-6) + 2$$

$$6. \ -1 - (-1) - (-1)$$

Practice C — Distribute with Negatives

Distribute. Then simplify.

$$1. \ -(x + 9)$$

$$2. \ -(4x - 7)$$

$$3. \ -3(2x - 5)$$

$$4. \ 2 - (x - 6)$$

$$5. \ -(2x + 3y)$$

$$6. \ -(a - b + c)$$

$$7. \ -5(3m + 2) - (-4m)$$

Practice D — Simplify Expressions

Simplify completely.

1. $-7x + 3x$

2. $8y - (3y - 5)$

3. $-(2x - 3) + (x - 10)$

4. $4a - 2(a - 6)$

5. $-3(2p - 1) + 5p$

6. $6 - 2(4 - x)$

Challenge (optional)

Take your time. Check your signs.

1. Simplify: $-(2x - 5) - (3x + 4) + 9$

2. Simplify: $-(4 - (2y - 7))$

3. Simplify: $3(-(x - 2)) - 2(x - 6)$
4. A number is -8 units from 0 . What are the possible numbers? Explain.