

# Integer Addition and Subtraction

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Score: \_\_\_\_\_ / 24

## Q Quick Review

To **add integers with the same sign**, add their absolute values and keep the sign. To **add integers with different signs**, subtract the smaller absolute value from the larger and take the sign of the number that is farther from zero. For **subtraction**, use the rule “**add the opposite**”:  $a - b$  becomes  $a + (-b)$ . So  $4 - 9 = 4 + (-9) = -5$ , and  $-5 - (-8) = -5 + 8 = 3$ . Picture moving on a number line: adding a positive moves right, adding a negative moves left.

◇ **Example:** Find  $-8 + 5$ .

⇒ The two numbers have different signs, so we will subtract their absolute values. The absolute values are 8 and 5; the larger is 8, and  $8 - 5 = 3$ . Now, which sign does the answer take? It takes the sign of the number farther from zero, and that is  $-8$ , which is negative. So the answer is  $-3$ . Picture it on a number line: start at  $-8$ , move 5 steps right, and you land on  $-3$ .

**Answer:**  $-3$

## PRACTICE

Add or subtract the integers.

- |                 |       |                        |       |
|-----------------|-------|------------------------|-------|
| 1. $-8 + 5$     | _____ | 11. $8 - 15$           | _____ |
| 2. $10 + (-4)$  | _____ | 12. $-3 - 7$           | _____ |
| 3. $7 + (-12)$  | _____ | 13. $-9 - 4 + 6$       | _____ |
| 4. $-6 + (-9)$  | _____ | 14. $-5 - (-8)$        | _____ |
| 5. $-7 + (-7)$  | _____ | 15. $6 - (-5)$         | _____ |
| 6. $-15 + 15$   | _____ | 16. $-2 - (-2)$        | _____ |
| 7. $-20 + 12$   | _____ | 17. $-11 - (-4)$       | _____ |
| 8. $13 + (-20)$ | _____ | 18. $0 - (-6)$         | _____ |
| 9. $-18 + 25$   | _____ | 19. $3 + (-8) + 5$     | _____ |
| 10. $4 - 9$     | _____ | 20. $-1 + (-1) + (-1)$ | _____ |

## ◆ Word Problems

21. The temperature was  $-5^{\circ}\text{F}$  in the morning and rose  $18^{\circ}\text{F}$  by afternoon. What was the afternoon temperature? \_\_\_\_\_
22. A submarine starts at  $-120$  feet, rises 45 feet, then dives 30 feet. What is its final depth? \_\_\_\_\_
23. A bank account has a balance of  $-\$8$  (overdrawn). After a deposit, the change is  $-(-15)$  dollars. What is the new balance? \_\_\_\_\_
24. In a game, Priya loses 2 points, then 3 points, then 4 points. What is her total change in score? \_\_\_\_\_



## Answer Keys

- |                                      |                                            |
|--------------------------------------|--------------------------------------------|
| 1. <input type="text" value="-3"/>   | 13. <input type="text" value="-7"/>        |
| 2. <input type="text" value="6"/>    | 14. <input type="text" value="3"/>         |
| 3. <input type="text" value="-5"/>   | 15. <input type="text" value="11"/>        |
| 4. <input type="text" value="-15"/>  | 16. <input type="text" value="0"/>         |
| 5. <input type="text" value="-14"/>  | 17. <input type="text" value="-7"/>        |
| 6. <input type="text" value="0"/>    | 18. <input type="text" value="6"/>         |
| 7. <input type="text" value="-8"/>   | 19. <input type="text" value="0"/>         |
| 8. <input type="text" value="-7"/>   | 20. <input type="text" value="-3"/>        |
| 9. <input type="text" value="7"/>    | 21. <input type="text" value="13°F"/>      |
| 10. <input type="text" value="-5"/>  | 22. <input type="text" value="-105 feet"/> |
| 11. <input type="text" value="-7"/>  | 23. <input type="text" value="\$7"/>       |
| 12. <input type="text" value="-10"/> | 24. <input type="text" value="-9 points"/> |

### Step-by-Step Explanations

- |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>1. Different signs: <math>8 - 5 = 3</math>, and the sign follows <math>-8</math>, so <math>-3</math>.</p> <p>2. Different signs: <math>10 - 4 = 6</math>, and the sign follows <math>10</math>, so <math>6</math>.</p> <p>3. Different signs: <math>12 - 7 = 5</math>, and the sign follows <math>-12</math>, so <math>-5</math>.</p> <p>4. Same sign: add absolute values <math>6 + 9 = 15</math> and keep the sign, so <math>-15</math>.</p> <p>5. Same sign: <math>7 + 7 = 14</math>, keep the negative sign, so <math>-14</math>.</p> <p>6. A number plus its opposite is always 0.</p> <p>7. Different signs: <math>20 - 12 = 8</math>, sign follows <math>-20</math>, so <math>-8</math>.</p> <p>8. Different signs: <math>20 - 13 = 7</math>, sign follows <math>-20</math>, so <math>-7</math>.</p> <p>9. Different signs: <math>25 - 18 = 7</math>, sign follows <math>25</math>, so <math>7</math>.</p> <p>10. Add the opposite: <math>4 + (-9) = -5</math>.</p> <p>11. Add the opposite: <math>8 + (-15) = -7</math>.</p> <p>12. Add the opposite: <math>-3 + (-7) = -10</math>.</p> <p>13. Work left to right: <math>-9 - 4 = -13</math>, then <math>-13 + 6 = -7</math>.</p> | <p>14. Add the opposite: <math>-5 + 8 = 3</math>.</p> <p>15. Add the opposite: <math>6 + 5 = 11</math>.</p> <p>16. Add the opposite: <math>-2 + 2 = 0</math>.</p> <p>17. Add the opposite: <math>-11 + 4 = -7</math>.</p> <p>18. Add the opposite: <math>0 + 6 = 6</math>.</p> <p>19. Work left to right: <math>3 + (-8) = -5</math>, then <math>-5 + 5 = 0</math>.</p> <p>20. Same sign each time: <math>-1 + (-1) + (-1) = -3</math>.</p> <p>21. Start at <math>-5</math> and add the rise: <math>-5 + 18 = 13</math>, so the afternoon temperature was <math>13^\circ\text{F}</math>.</p> <p>22. Rising adds, diving subtracts: <math>-120 + 45 - 30 = -105</math> feet.</p> <p>23. The deposit removes the negative: <math>-8 - (-15) = -8 + 15 = 7</math>, so the new balance is <math>\\$7</math>.</p> <p>24. Each loss is negative: <math>-2 + (-3) + (-4) = -9</math> points.</p> |
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