

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°F in the morning and rose 18°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

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