

# Opposites and Absolute Value

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Score: \_\_\_\_\_ / 24

## Quick Review

Two numbers are **opposites** if they are the same distance from 0 but on different sides — like 7 and  $-7$ . The opposite of a number just flips its sign, and the opposite of 0 is 0. The **absolute value** of a number, written  $|x|$ , is its *distance* from 0 on the number line, so it is never negative. For example,  $|-7| = 7$  and  $|7| = 7$  because both are 7 units from zero. Watch the signs carefully:  $-(-9)$  means “the opposite of  $-9$ ,” which is 9.

◇ **Example:** Find  $|-12|$  and the opposite of  $-12$ .

⇒ Start with absolute value.  $|-12|$  asks: how far is  $-12$  from 0 on the number line? It is 12 units away, so  $|-12| = 12$ . Distance is never negative. Now the opposite: the opposite of a number is found on the other side of 0, the same distance away. The opposite of  $-12$  is 12. Interesting — for this number the absolute value and the opposite turned out the same, because  $-12$  is negative.

**Answer:**  $|-12| = 12$ , opposite = 12

## PRACTICE

Find each value.

- |              |       |                           |       |
|--------------|-------|---------------------------|-------|
| 1. $ 6 $     | _____ | 11. The opposite of 9     | _____ |
| 2. $ -6 $    | _____ | 12. The opposite of $-9$  | _____ |
| 3. $ 15 $    | _____ | 13. The opposite of 14    | _____ |
| 4. $ -7 $    | _____ | 14. The opposite of $-25$ | _____ |
| 5. $ 0 $     | _____ | 15. The opposite of 0     | _____ |
| 6. $ -23 $   | _____ | 16. $-(-5)$               | _____ |
| 7. $ 100 $   | _____ | 17. $-(-8)$               | _____ |
| 8. $ -3/4 $  | _____ | 18. $-(-(-5))$            | _____ |
| 9. $ -12.5 $ | _____ | 19. $ -3  +  4 $          | _____ |
| 10. $ 8.2 $  | _____ | 20. $ -10  -  2 $         | _____ |

## Word Problems

21. A submarine is at a depth represented by  $-90$  feet. What is its distance from sea level? \_\_\_\_\_
22. Two towns sit on a number line: one at  $-15$  and one at  $15$  (in miles from the city center). How are these two positions related?  
\_\_\_\_\_
23. A bank account balance is  $-\$45$  (overdrawn). How much money is owed? \_\_\_\_\_
24. On a cold morning the temperature was  $-8$  degrees. Later it was the opposite of that. What was the later temperature?  
\_\_\_\_\_



## Answer Keys

- |                  |                        |
|------------------|------------------------|
| 1. 6             | 13. -14                |
| 2. 6             | 14. 25                 |
| 3. 15            | 15. 0                  |
| 4. 7             | 16. 5                  |
| 5. 0             | 17. 8                  |
| 6. 23            | 18. -5                 |
| 7. 100           | 19. 7                  |
| 8. $\frac{3}{4}$ | 20. 8                  |
| 9. 12.5          | 21. 90 feet            |
| 10. 8.2          | 22. They are opposites |
| 11. -9           | 23. \$45               |
| 12. 9            | 24. 8 degrees          |

### Step-by-Step Explanations

- |  |   |
|--|---|
| <p>1. 6 is 6 units from 0, so <math> 6  = 6</math>.</p> <p>2. -6 is 6 units from 0, so <math> -6  = 6</math>.</p> <p>3. 15 is 15 units from 0, so <math> 15  = 15</math>.</p> <p>4. -7 sits 7 units from 0, so <math> -7  = 7</math>.</p> <p>5. 0 is 0 units from itself, so <math> 0  = 0</math>.</p> <p>6. -23 is 23 units from 0, so <math> -23  = 23</math>.</p> <p>7. 100 is 100 units from 0, so <math> 100  = 100</math>.</p> <p>8. <math>-\frac{3}{4}</math> is <math>\frac{3}{4}</math> unit from 0, so the absolute value is <math>\frac{3}{4}</math>.</p> <p>9. -12.5 is 12.5 units from 0, so <math> -12.5  = 12.5</math>.</p> <p>10. 8.2 is 8.2 units from 0, so <math> 8.2  = 8.2</math>.</p> <p>11. The opposite flips the sign, so the opposite of 9 is -9.</p> <p>12. The opposite of -9 flips the sign to 9.</p> <p>13. Flipping the sign of 14 gives -14.</p> | <p>14. Flipping the sign of -25 gives 25.</p> <p>15. 0 is its own opposite — it sits right at the center.</p> <p>16. <math>-(-5)</math> means the opposite of -5, which is 5.</p> <p>17. <math>-(-8)</math> means the opposite of -8, which is 8.</p> <p>18. Work outward: the opposite of -5 is 5, and the opposite of 5 is -5.</p> <p>19. <math> -3  = 3</math> and <math> 4  = 4</math>, so the sum is <math>3 + 4 = 7</math>.</p> <p>20. <math> -10  = 10</math> and <math> 2  = 2</math>, so <math>10 - 2 = 8</math>.</p> <p>21. Distance from sea level is the absolute value: <math> -90  = 90</math> feet. Distance is always positive.</p> <p>22. 15 and -15 are the same distance from 0 but on opposite sides, so they are opposites.</p> <p>23. The amount owed is the absolute value of the balance: <math> -45  = 45</math>, so \$45 is owed.</p> <p>24. The opposite of -8 flips the sign, giving 8 degrees.</p> |
|--|---|



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