Integers and Absolute Value

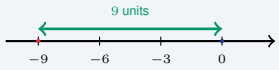
Name: _____	Date: _____	Score: _____ / 18

Quick Review and Helpful Hints

The absolute value $|n|$ is the distance of n from 0 on the number line, so it is never negative: $|-7| = 7$ and $|7| = 7$. Watch a minus sign *outside* the bars – evaluate the absolute value first, then apply the sign: $-|-5| = -(5) = -5$. On the number line, numbers farther right are greater.

▷ **Example:** Evaluate $-|-9|$. **Work:** Work inside the bars first: $|-9| = 9$ because -9 is 9 units from zero. Then apply the minus sign outside.

★ **Answer:** -9



$|-9| = 9$ (distance from 0).

Practice Problems

Evaluate each expression.

1. $|-8|$ _____
2. $|15|$ _____
3. $-|-7|$ _____
4. $|-34|$ _____
5. $-|12|$ _____
6. $|0|$ _____
7. $|-23|$ _____
8. $-|-20|$ _____
9. $|7| - |-7|$ _____
10. $|-13| + |-8|$ _____
11. $|-6| \cdot |-4|$ _____
12. $|-3|^2$ _____
13. $|8 - 15|$ _____
14. $|-100| \div |-25|$ _____

Word Problems

15. Diver A is at -340 feet and Diver B is at -180 feet. Using absolute value, who is closer to the surface, and by how much? _____
16. An account balance is $-\$62$. Write the amount owed as a positive number. _____
17. On a cold morning, one town is -5° and another is 3°. Which town is colder? _____
18. Points $P = -7$ and $R = 5$ lie on a number line. Find $|P| + |R|$, the total distance of the two points from zero. _____

Answer Keys

1. $\boxed{8}$	**7.** $\boxed{23}$	**13.** $\boxed{7}$
2. $\boxed{15}$	**8.** $\boxed{-20}$	**14.** $\boxed{4}$
3. $\boxed{-7}$	**9.** $\boxed{0}$	**15.** $\boxed{\text{B, by } 160 \text{ ft}}$
4. $\boxed{34}$	**10.** $\boxed{21}$	**16.** $\boxed{\$62}$
5. $\boxed{-12}$	**11.** $\boxed{24}$	**17.** $\boxed{-5^\circ}$
6. $\boxed{0}$	**12.** $\boxed{9}$	**18.** $\boxed{12}$

Step-by-Step Explanations

1. Start by naming the process: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Absolute value is the distance from zero, and -8 is 8 units away, so $|-8| = 8$. So the final answer is 8.

2. A good way to think about this is: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is 15 is already 15 units from zero, so $|15| = 15$. So the final answer is 15.

3. Step by step: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Work inside the bars first: $|-7| = 7$. Then the minus sign outside makes it -7. So the final answer is -7.

4. Take it one move at a time: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is The distance of -34 from zero is 34. So the final answer is 34.

5. Start by naming the process: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Inside first: $|12| = 12$. The outside minus gives -12. So the final answer is -12.

6. A good way to think about this is: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Zero is 0 units from itself, so $|0| = 0$. So the final answer is 0.

7. Step by step: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is The distance of -23 from zero is 23. So the final answer is 23.

8. Take it one move at a time: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Inside first: $|-20| = 20$. The outside minus gives -20. So the final answer is -20.

9. Start by naming the process: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Each absolute value is 7, so $7 - 7 = 0$. So the final answer is 0.

10. A good way to think about this is: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is $|-13| = 13$ and $|-8| = 8$, so $13 + 8 = 21$. So the final answer is 21.

11. Step by step: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is $|-6| = 6$ and $|-4| = 4$, so $6 \times 4 = 24$. So the final answer is 24.

12. Take it one move at a time: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is First take the absolute value: $|-3| = 3$. Then square it: $3^2 = 9$. So the final answer is 9.

13. Start by naming the process: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Simplify inside the bars first: $8 - 15 = -7$, and $|-7| = 7$. So the final answer is 7.

14. A good way to think about this is: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is $|-100| = 100$ and $|-25| = 25$, so $100 \div 25 = 4$. So the final answer is 4.

15. Step by step: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Compare distances below the surface with absolute value: $|-180| = 180$ and $|-340| = 340$. Since $180 < 340$, Diver B is closer, by $340 - 180 = 160$ ft. So the final answer is B, by 160 ft.

16. Take it one move at a time: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is A balance of $-\$62$ means $\$62$ is owed, which is $|-62| = \$62$. So the final answer is $\$62$.

17. Start by naming the process: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is On the number line -5 lies to the left of 3, so -5° is the colder town. So the final answer is -5°.

18. A good way to think about this is: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Find each point's distance from zero: $|-7| = 7$ and $|5| = 5$, then add: $7 + 5 = 12$. So the final answer is 12.

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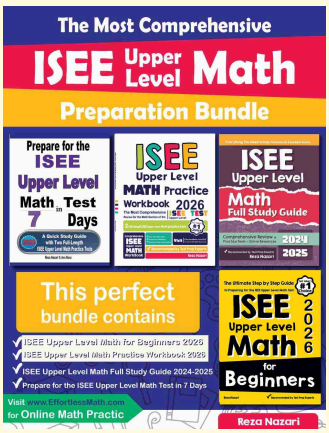

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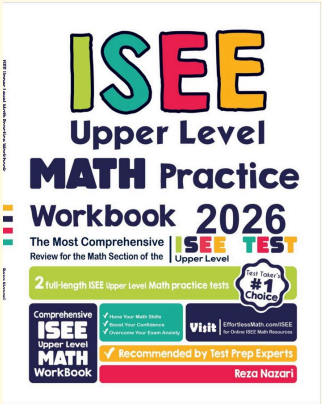

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