

# Comparing and Ordering Integers

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

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

Score: \_\_\_\_\_ / 18

The trick to comparing integers is to picture them on a number line. Numbers get larger as you move to the **right** and smaller as you move to the **left**. This is especially handy with negatives—for example,  $-3$  is greater than  $-8$  because  $-3$  is closer to zero (farther right on the line). When a problem asks you to *order* integers from least to greatest, you are simply listing them in the same left-to-right order they appear on the number line. Once you have this picture in your head, symbols like  $<$ ,  $>$ , and  $=$  become second nature.

## Key Concepts & Quick Review

**Comparing:**  $a > b$  means  $a$  is to the **right** of  $b$  on the number line.  $a < b$  means  $a$  is to the **left** of  $b$ .

**Negatives rule:** Among two negative integers, the one **closer to zero** is **greater**. **Ordering:** list integers from least (leftmost) to greatest (rightmost).



## Examples

① Compare  $-7$  and  $-3$ . Write  $<$ ,  $>$ , or  $=$ .

**Think It Through:** Put both numbers on a number line in your mind. The number  $-3$  is closer to zero, so it sits to the right of  $-7$ . Numbers to the right are greater, and numbers to the left are smaller. Therefore  $-7 < -3$ .

**Answer:**  $-7 < -3$

② Order from **least to greatest:**  $4, -9, 2, -1, -6$ .

**Think It Through:** Imagine placing all five integers on a number line. The farthest left is  $-9$ , then comes  $-6$ , then  $-1$ . After the negatives come the positives:  $2$  and then  $4$ . Reading from left to right gives the order from least to greatest.

**Answer:**  $-9 < -6 < -1 < 2 < 4$

## Practice Problems

Write  $<$ ,  $>$ , or  $=$  in each box to make the statement true.



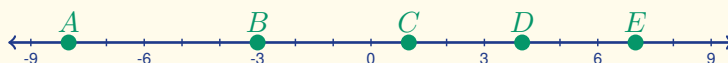
- |                      |       |                           |       |
|----------------------|-------|---------------------------|-------|
| 1. $-5 \square -2$   | _____ | 9. $- -4  \square -4$     | _____ |
| 2. $-8 \square -11$  | _____ | 10. $ -10  \square  -12 $ | _____ |
| 3. $7 \square -7$    | _____ | 11. $-20 \square -19$     | _____ |
| 4. $-4 \square 0$    | _____ | 12. $0 \square -1$        | _____ |
| 5. $-15 \square -15$ | _____ | 13. $-(-3) \square -3$    | _____ |
| 6. $-1 \square -100$ | _____ | 14. $- 7  \square -7$     | _____ |
| 7. $-9 \square 3$    | _____ | 15. $-25 \square -52$     | _____ |
| 8. $ -6  \square 6$  | _____ |                           |       |

**Study Tips**

- 👉 Among two negative integers, the one with the **smaller absolute value** is **greater**:  $-3 > -10$  because  $3 < 10$ .
- 👉 Any positive integer is always greater than any negative integer:  $1 > -1,000,000$ .
- 👉 When ordering a mixed set, negatives always come before zero, and zero comes before all positives.

**Word Problems**

16. Five students competed in a math quiz bowl where correct answers earn points and incorrect answers lose points. Their final net scores were:  $-16$ ,  $8$ ,  $-4$ ,  $-21$ , and  $5$ . Order the scores from *lowest to highest* and identify the student with the best score and the student with the worst score. Then find the range of scores (highest minus lowest). \_\_\_\_\_
17. Four ocean animals are recorded at the following depths below the surface: a shark at  $-85$  feet, a jellyfish at  $-12$  feet, a sperm whale at  $-210$  feet, and a yellowfin tuna at  $-47$  feet. Order the animals from *shallowest to deepest* depth. How much deeper is the sperm whale than the shark? \_\_\_\_\_
18. Five points are plotted on the number line shown here. Identify the integer at each point, then list the points in order from *least to greatest*. Which point has the greatest absolute value? \_\_\_\_\_



## Answer Keys

- |   |   |
|---|---|
| <p>1) &lt;<br/>2) &gt;<br/>3) &gt;<br/>4) &lt;<br/>5) =<br/>6) &gt;<br/>7) &lt;<br/>8) =<br/>9) =<br/>10) &lt;<br/>11) &lt;</p> | <p>12) &gt;<br/>13) &gt;<br/>14) =<br/>15) &gt;<br/>16) Order: <math>-21 &lt; -16 &lt; -4 &lt; 5 &lt; 8</math>; best: 8, worst: <math>-21</math>; range = 29.<br/>17) Shallowest to deepest: jellyfish, tuna, shark, whale; whale is 125 <i>ft</i> deeper.<br/>18) <math>A = -8, B = -3, C = 1, D = 4, E = 7</math>; order: <math>A &lt; B &lt; C &lt; D &lt; E</math>; greatest absolute value: <math>A</math></p> |
|---|---|

### Step-by-Step Explanations

**Strategy:** For Comparing and Ordering Integers, compare by position, not by how large the digits look; farther left means smaller, and farther right means greater. A quick integer-comparison check is whether the final answer matches what the question asks for.

**Practice 1:**  $-5 \square -2$  **Answer:** <

At the beginning of the practice, place both integers mentally on the number line; the one farther left is smaller.

**Practice 15:**  $-25 \square -52$  **Answer:** >

For the second model problem, place both integers mentally on the number line; the one farther left is smaller.

#### Word-problem notes:

**16. Answer:** Order:  $-21 < -16 < -4 < 5 < 8$ ; best: 8, worst:  $-21$ ; range = 29.

Order the scores from most negative to most positive:  $-21, -16, -4, 5, 8$ . The best score is the greatest number, which is 8. The worst score is the least number, which is  $-21$ . The range is highest minus lowest:  $8 - (-21) = 29$ .

**17. Answer:** Shallowest to deepest: jellyfish, tuna, shark, whale; whale is 125 *ft* deeper.

Shallowest means closest to zero, so compare the depths on a number line. That gives  $-12, -47, -85, -210$ , which corresponds to jellyfish, tuna, shark, and whale. To find how much deeper the whale is than the shark, subtract the depths:  $-210 - (-85) = -125$ . The whale is therefore 125 feet deeper.

**18. Answer:**  $A = -8, B = -3, C = 1, D = 4, E = 7$ ; order:  $A < B < C < D < E$ ;  $A$  has the greatest absolute value ( $|A| = 8$ ).

Read each value off the number line:  $A = -8, B = -3, C = 1, D = 4, E = 7$ . Negative numbers are less than positives, and among negatives the more negative number is smaller, so the order from least to greatest is  $A, B, C, D, E$ . The absolute values are 8, 3, 1, 4, 7; the greatest is 8, which belongs to point  $A$ .



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