

# Rational Numbers on the Number Line

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

## Q Quick Review

A **rational number** is any number that can be written as a fraction — this includes whole numbers, fractions, decimals, and their negatives. Every rational number has a home on the **number line**. Positive numbers sit to the right of 0 and negative numbers to the left. To plot a fraction like  $\frac{3}{4}$ , split the space between 0 and 1 into 4 equal parts and count 3 of them. For  $-\frac{3}{4}$ , count 3 parts the same way but to the *left* of 0. The farther right a number is, the greater it is.

◇ **Example:** Plot  $-\frac{5}{2}$  on a number line.

⇒ First rewrite  $-\frac{5}{2}$  as a mixed number:  $\frac{5}{2} = 2\frac{1}{2}$ , so  $-\frac{5}{2} = -2\frac{1}{2}$ . That tells us the point sits between  $-2$  and  $-3$ , since it is more negative than  $-2$ . Split the space between  $-2$  and  $-3$  into two equal halves and land on the mark exactly halfway — that is  $-2\frac{1}{2}$ . So  $-\frac{5}{2}$  is plotted halfway between  $-2$  and  $-3$  on the number line.

**Answer:** halfway between  $-2$  and  $-3$

## PRACTICE

Describe where each number sits on the number line.

- |                           |       |                           |       |
|---------------------------|-------|---------------------------|-------|
| 1. Locate $\frac{1}{2}$   | _____ | 11. Locate 0.75           | _____ |
| 2. Locate $-\frac{1}{2}$  | _____ | 12. Locate $-0.25$        | _____ |
| 3. Locate $\frac{3}{4}$   | _____ | 13. Locate $\frac{4}{3}$  | _____ |
| 4. Locate $-\frac{3}{4}$  | _____ | 14. Locate $-\frac{4}{3}$ | _____ |
| 5. Locate $\frac{5}{2}$   | _____ | 15. Locate 3              | _____ |
| 6. Locate $-\frac{7}{2}$  | _____ | 16. Locate $-3$           | _____ |
| 7. Locate 1.5             | _____ | 17. Locate $\frac{7}{4}$  | _____ |
| 8. Locate $-2.5$          | _____ | 18. Locate $-\frac{9}{4}$ | _____ |
| 9. Locate $\frac{1}{4}$   | _____ | 19. Locate 2.25           | _____ |
| 10. Locate $-\frac{1}{4}$ | _____ | 20. Locate $-1.75$        | _____ |

## ◆ Word Problems

21. On a number line, point *A* is at  $-\frac{3}{2}$  and point *B* is at  $\frac{3}{2}$ . Describe where each point sits. \_\_\_\_\_
22. A thermometer reading is  $-2.5$  degrees. Between which two whole-number marks does it fall? \_\_\_\_\_
23. A frog sits at  $\frac{7}{4}$  on a number line. Write this as a mixed number and describe its location. \_\_\_\_\_
24. A diver descends to  $-\frac{9}{4}$  meters. Write this as a mixed number and describe its position. \_\_\_\_\_



## Answer Keys

- |  |  |
|--|--|
| <ol style="list-style-type: none"> <li>1. <span style="border: 1px solid black; border-radius: 5px; padding: 2px;">halfway between 0 and 1</span></li> <li>2. <span style="border: 1px solid black; border-radius: 5px; padding: 2px;">halfway between 0 and - 1</span></li> <li>3. <span style="border: 1px solid black; border-radius: 5px; padding: 2px;">three-fourths from 0 toward 1</span></li> <li>4. <span style="border: 1px solid black; border-radius: 5px; padding: 2px;">three-fourths from 0 toward - 1</span></li> <li>5. <span style="border: 1px solid black; border-radius: 5px; padding: 2px;">halfway between 2 and 3</span></li> <li>6. <span style="border: 1px solid black; border-radius: 5px; padding: 2px;">halfway between - 3 and - 4</span></li> <li>7. <span style="border: 1px solid black; border-radius: 5px; padding: 2px;">halfway between 1 and 2</span></li> <li>8. <span style="border: 1px solid black; border-radius: 5px; padding: 2px;">halfway between - 2 and - 3</span></li> <li>9. <span style="border: 1px solid black; border-radius: 5px; padding: 2px;">one-fourth from 0 toward 1</span></li> <li>10. <span style="border: 1px solid black; border-radius: 5px; padding: 2px;">one-fourth from 0 toward - 1</span></li> <li>11. <span style="border: 1px solid black; border-radius: 5px; padding: 2px;">three-fourths from 0 toward 1</span></li> <li>12. <span style="border: 1px solid black; border-radius: 5px; padding: 2px;">one-fourth from 0 toward - 1</span></li> </ol> | <ol style="list-style-type: none"> <li>13. <span style="border: 1px solid black; border-radius: 5px; padding: 2px;">one-third past 1 toward 2</span></li> <li>14. <span style="border: 1px solid black; border-radius: 5px; padding: 2px;">one-third past - 1 toward - 2</span></li> <li>15. <span style="border: 1px solid black; border-radius: 5px; padding: 2px;">three units right of 0</span></li> <li>16. <span style="border: 1px solid black; border-radius: 5px; padding: 2px;">three units left of 0</span></li> <li>17. <span style="border: 1px solid black; border-radius: 5px; padding: 2px;">three-fourths past 1 toward 2</span></li> <li>18. <span style="border: 1px solid black; border-radius: 5px; padding: 2px;">one-fourth past - 2 toward - 3</span></li> <li>19. <span style="border: 1px solid black; border-radius: 5px; padding: 2px;">one-fourth past 2 toward 3</span></li> <li>20. <span style="border: 1px solid black; border-radius: 5px; padding: 2px;">three-fourths past - 1 toward - 2</span></li> <li>21. <span style="border: 1px solid black; border-radius: 5px; padding: 2px;">A at <math>-1\frac{1}{2}</math>, B at <math>1\frac{1}{2}</math></span></li> <li>22. <span style="border: 1px solid black; border-radius: 5px; padding: 2px;">between -2 and -3</span></li> <li>23. <span style="border: 1px solid black; border-radius: 5px; padding: 2px;"><math>1\frac{3}{4}</math></span></li> <li>24. <span style="border: 1px solid black; border-radius: 5px; padding: 2px;"><math>-2\frac{1}{4}</math></span></li> </ol> |
|--|--|

### Step-by-Step Explanations

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|--|---|
| <ol style="list-style-type: none"> <li>1. <math>\frac{1}{2}</math> is one of two equal parts between 0 and 1, so it lands halfway.</li> <li>2. <math>-\frac{1}{2}</math> is halfway between 0 and -1, to the left of zero.</li> <li>3. Split 0 to 1 into 4 parts and count 3 of them.</li> <li>4. Split 0 to -1 into 4 parts and count 3 to the left.</li> <li>5. <math>\frac{5}{2} = 2\frac{1}{2}</math>, so it is halfway between 2 and 3.</li> <li>6. <math>-\frac{7}{2} = -3\frac{1}{2}</math>, halfway between -3 and -4.</li> <li>7. 1.5 sits exactly halfway between 1 and 2.</li> <li>8. -2.5 sits halfway between -2 and -3.</li> <li>9. Split 0 to 1 into 4 parts and count 1.</li> <li>10. Split 0 to -1 into 4 parts and count 1 to the left.</li> <li>11. <math>0.75 = \frac{3}{4}</math>, three-fourths of the way to 1.</li> <li>12. <math>-0.25 = -\frac{1}{4}</math>, one-fourth of the way to -1.</li> <li>13. <math>\frac{4}{3} = 1\frac{1}{3}</math>, just past 1 by one-third.</li> </ol> | <ol style="list-style-type: none"> <li>14. <math>-\frac{4}{3} = -1\frac{1}{3}</math>, just past -1 to the left.</li> <li>15. The whole number 3 sits 3 units to the right of zero.</li> <li>16. The integer -3 sits 3 units to the left of zero.</li> <li>17. <math>\frac{7}{4} = 1\frac{3}{4}</math>, three-fourths past 1.</li> <li>18. <math>-\frac{9}{4} = -2\frac{1}{4}</math>, one-fourth past -2 toward -3.</li> <li>19. <math>2.25 = 2\frac{1}{4}</math>, one-fourth of the way from 2 to 3.</li> <li>20. <math>-1.75 = -1\frac{3}{4}</math>, three-fourths from -1 toward -2.</li> <li>21. <math>\frac{3}{2} = 1\frac{1}{2}</math>, so B is halfway between 1 and 2, and A is halfway between -1 and -2.</li> <li>22. -2.5 is halfway between -2 and -3, so the reading falls between those two marks.</li> <li>23. <math>\frac{7}{4} = 1\frac{3}{4}</math>, so the frog is three-fourths of the way from 1 toward 2.</li> <li>24. <math>-\frac{9}{4} = -2\frac{1}{4}</math>, so the diver is one-fourth of the way from -2 down toward -3.</li> </ol> |
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