

Number Line Moves

Draw signed rational moves and explain what the result means.

GRADE 7 • 7.NR.1.3

7.NR.1.3 "Represent addition and subtraction with rational numbers on a horizontal or a vertical number line diagram to solve authentic problems."

NAME _____

DATE _____

Direction and displacement

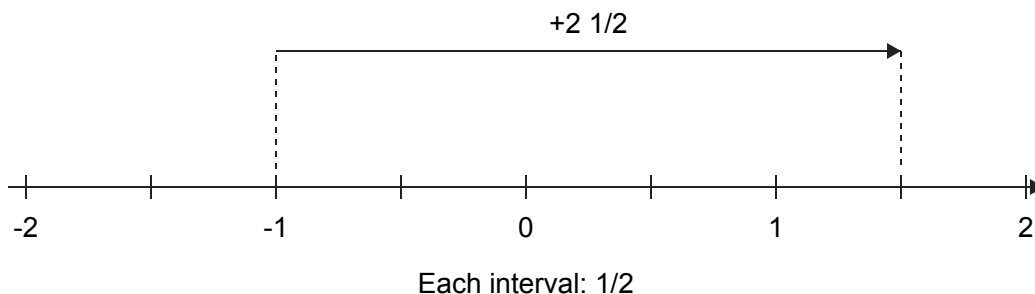
On a horizontal number line, values increase to the right. Add a positive number by moving right; add a negative number by moving left. Subtract by adding the opposite: subtracting a negative moves right. Each arrow starts where the previous move ended.

Worked example

At dawn it is -1°C . The temperature rises $2\frac{1}{2}^{\circ}\text{C}$. Draw the change and find the new temperature.

Start at -1 on the axis. Draw a rightward arrow of $+2\frac{1}{2}$ from -1 to $1\frac{1}{2}$.

$-1 + 2\frac{1}{2} = 1\frac{1}{2}^{\circ}\text{C}$.



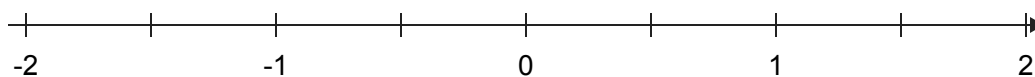
For tasks 2-7, mark the starting value, draw an arrow for each change, and label the final value. Write the equation and interpret the result with units. Fractions and decimals may name the same point.

1. Practice

A diver moves from $-\frac{1}{2}$ m to $-1\frac{1}{4}$ m relative to sea level. Without drawing yet, state the direction and signed change. Explain the sign.

2. Practice

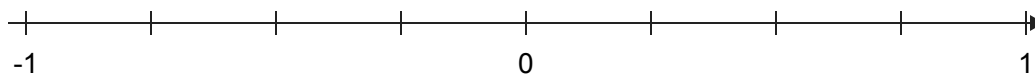
A freezer is at -1°C . Its temperature rises $1\frac{1}{2}^{\circ}\text{C}$. Show the move and find the new temperature.



Each interval: $\frac{1}{2}$

3. Practice

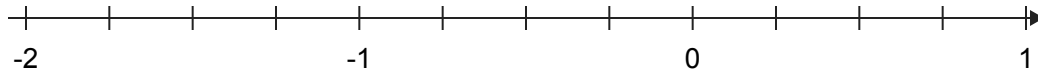
A pond level is $\frac{1}{2}$ m above its reference mark. It falls $1\frac{1}{4}$ m. Show the change and state the final level.



Each interval: $\frac{1}{4}$

4. Practice

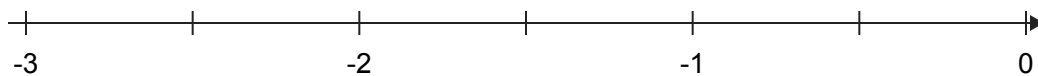
An account balance is $-\$1.50$. A mistaken charge of $\$0.75$ is reversed by subtracting $-\$0.75$ from the balance. Show the move and final balance.



Each interval: $\frac{1}{4}$

5. Apply

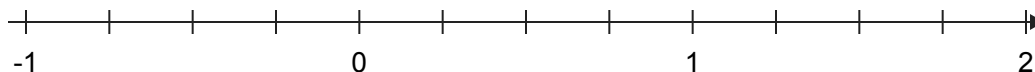
A submarine is at $-1\frac{1}{2}$ km relative to sea level. It descends another $\frac{1}{2}$ km. Show the move and state its new position.



Each interval: $\frac{1}{2}$

6. Apply

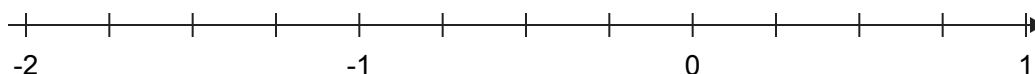
A storage meter reads +1.25 GB relative to its limit. Deleting 1.75 GB subtracts that amount. Show the change and explain the final reading.



Each interval: $\frac{1}{4}$

7. Challenge

A temperature is $-1\frac{1}{2}^{\circ}\text{C}$. Correcting a faulty reading requires subtracting -1°C ; it then falls $\frac{1}{2}^{\circ}\text{C}$. Draw both moves in order. Why does the first move go right?



Each interval: $\frac{1}{4}$

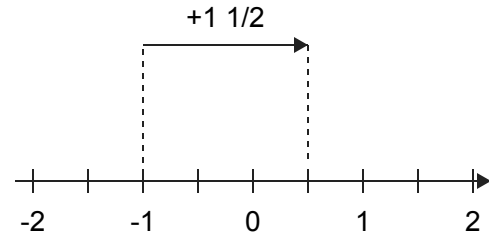
Sample arrows show signed displacement. Accept equivalent fraction or decimal labels, correct endpoints and contextual units.

Task 1

The change is $-3/4$ m, downward (left on a horizontal axis). $-1\frac{1}{4} - (-1/2) = -3/4$.

Task 2

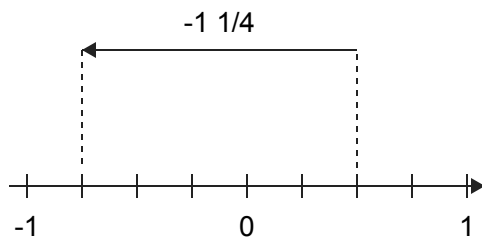
$-1 + 1\frac{1}{2} = 1/2^\circ\text{C}$; move right $1\frac{1}{2}$.



Each interval: $1/2$

Task 3

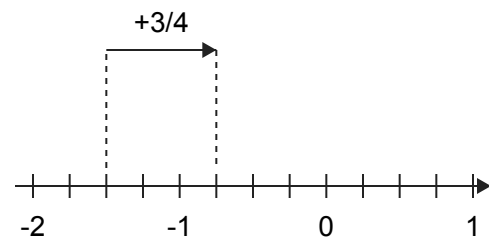
$1/2 + (-1\frac{1}{4}) = -3/4$ m; $3/4$ m below the mark.



Each interval: $1/4$

Task 4

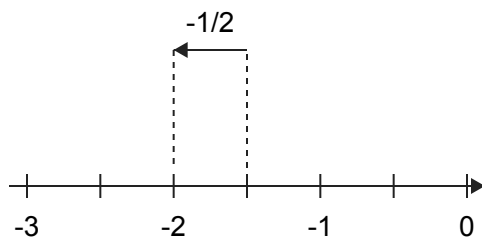
$-1.50 - (-0.75) = -1.50 + 0.75 = -\0.75 ; move right 0.75.



Each interval: $1/4$

Task 5

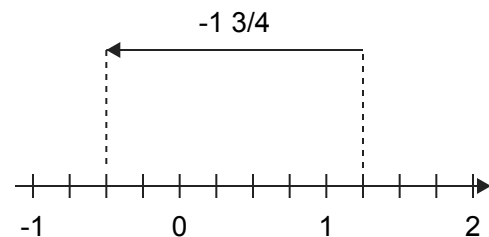
$-1\frac{1}{2} + (-1/2) = -2$ km, or 2 km below sea level. The negative change moves left. The endpoint is -2.



Each interval: $1/2$

Task 6

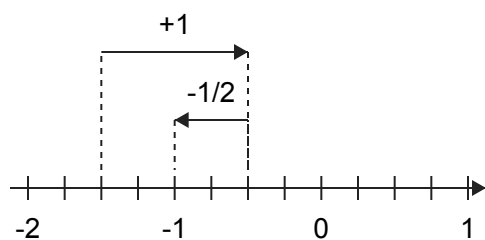
$1.25 - 1.75 = -0.50$ GB; storage is 0.50 GB below the limit. Start at 1.25 and move left 1.75 to -0.50.



Each interval: $1/4$

Task 7

$-1 \frac{1}{2} - (-1) + (-\frac{1}{2}) = -1^{\circ}\text{C}$. Subtracting -1 adds $+1$: move right to $-\frac{1}{2}$, then left $\frac{1}{2}$ to -1 .



Each interval: $\frac{1}{4}$