

DMT INSTITUTE

Developing Mathematical Thinking Institute (DMTI)



Professional
Development



Curricular
Resources



Assessment

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Integers and Rational Numbers

CONCEPTS

DMTI Varied Practice Worksheets

This PowerPoint or PDF displays the worksheets that have varied situations (context, visual, equations, and other mathematical models) for children to work on. By completing these worksheets, children increase their foundational skills in the topic, which will help them with these standards and future mathematical topics.

1. If using a journal, have children present the worksheet and complete all the problems.
2. Or print the 'Varied Practice Worksheet Slides' for them to work on. Then, you can return to the PowerPoint or PDF to look at the keys to check their work.

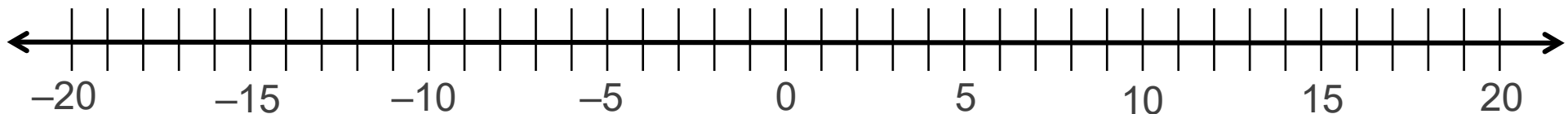
Integers and Rational Numbers: Concepts

Integers are positive numbers (1, 2, 3, . . .), negative numbers (−1, −2, −3, . . .) and 0, but not fractional amounts.

Rational numbers are numbers that are positive and negative and can be **written as a fraction**. All integers can also be written as a fraction, so they are also considered rational numbers. For example, 17 is also $\frac{17}{1}$ or −12 can be written as $-\frac{12}{1}$.

We can place integers and rational numbers on the number line. Look at the numbers below? Which are integers? Which are rational numbers? Where would they be placed on the number line?

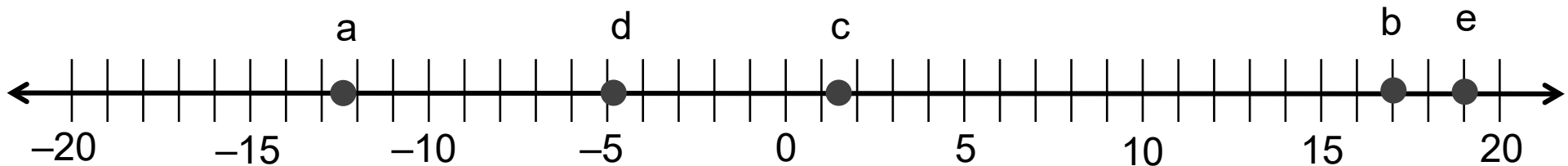
- a. −12.3 b. 17 c. $1\frac{1}{2}$ d. −4.9 e. 19



Integers and Rational Numbers: Concepts

All of the numbers listed below are rational numbers, but only 17 and 19 are also integers. The dots on the number line indicate where each number would be placed.

- a. -12.3 b. 17 c. $1\frac{1}{2}$ d. -4.9 e. 19



Integers and Rational Numbers: Concepts

Here are three vertical number lines that each represent a different situation: temperature, profit/loss (in money) and sea level.

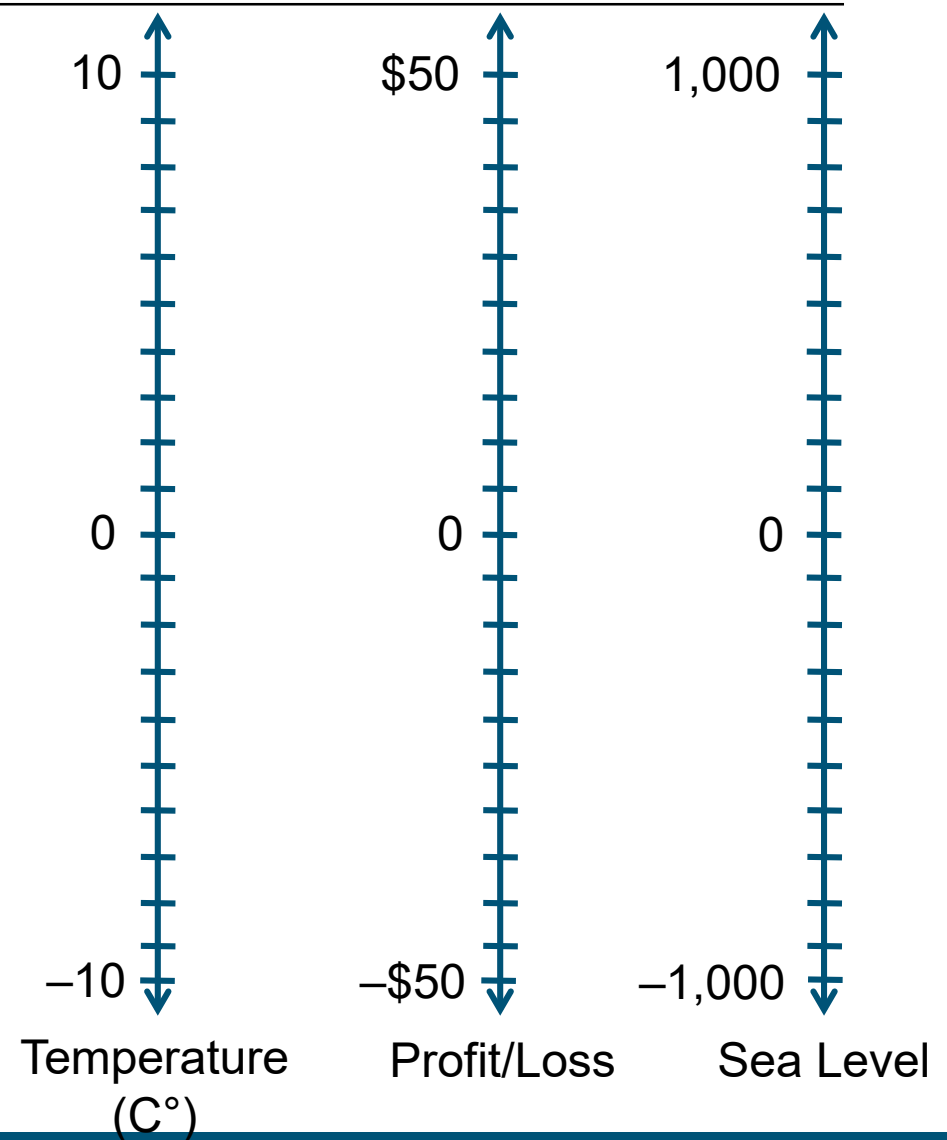
What does 0 mean for each of the following situations: Temperature, Profit/Loss, and Sea Level?

Zero is a starting point. You must define what it means and then you can describe the positive numbers (above or to the right of zero) and negative numbers (below or to the left of zero).

For Celsius, 0° is where water freezes. Above zero, water gets warmer and below zero it gets colder.

For money, 0 means you have none. A positive number means you have money and a negative number means you owe money.

And the ocean's surface is the starting point or zero for calculating the height of geographical features. Land and mountains are positive numbers and valleys in the ocean are negative numbers.

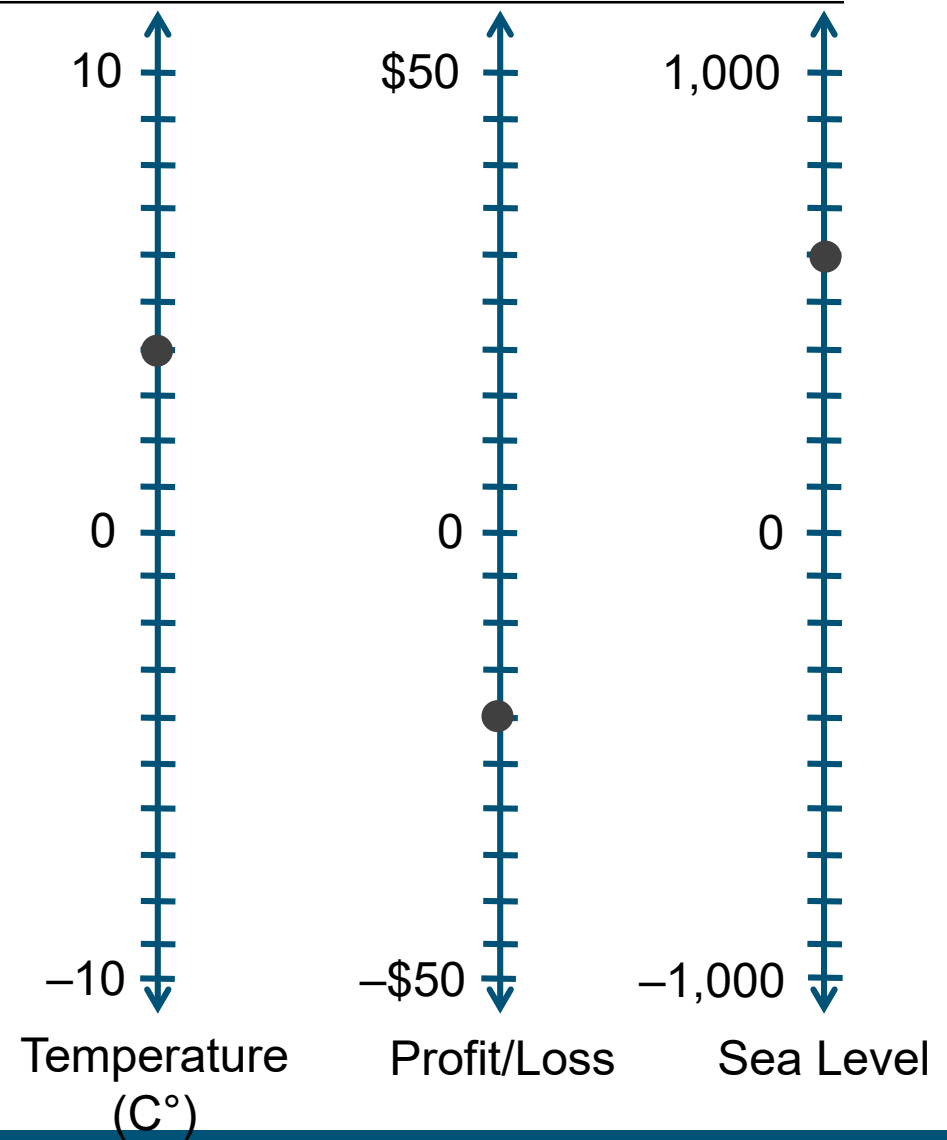


Integers and Rational Numbers: Concepts

Now that we have defined 0 for each situation we can think about placing other points on the line.

An example has been added to each number line.

- The dot on the temperature line is at 4 degrees.
- The dot on the profit/loss line represents owing \$20
- The dot on the sea level line represents being 600 feet above sea level



Grade 6-8 Integers and Rational Numbers: Concepts

Materials Needed

Printed copies of the Integer and Rational Number worksheets

Instructions

Worksheet 1.1 & 1.2

A) Place a mark (dot, x . . .) for each statement at the appropriate place on each number line. Label the mark with the corresponding letter.

Note: worksheet 1.2 includes more difficult number sets

Worksheet 2.1 & 2.2

A) Generate statements for each dot on the number lines.

Note: worksheet 2.2 includes more difficult number sets

Worksheet 1.1 – Integers and Rational Numbers: Concepts

Here are three vertical number lines that each represent a different situation: temperature, profit/loss (in money) and sea level.

1. Place zero at the center of each number line. Make sure it is the same for each number line.
2. Place each of the following statements as a point on the appropriate number line. (You will need to consider what scale to use for each number line)

a.	\$5	f.	-10 feet
b.	7 feet below sea level	g.	No Money
c.	Owe \$8	h.	4° below zero
d.	9 degrees	i.	The ocean's surface
e.	7° below zero	j.	4 feet above sea level



Temperature
(C°)



Profit/Loss



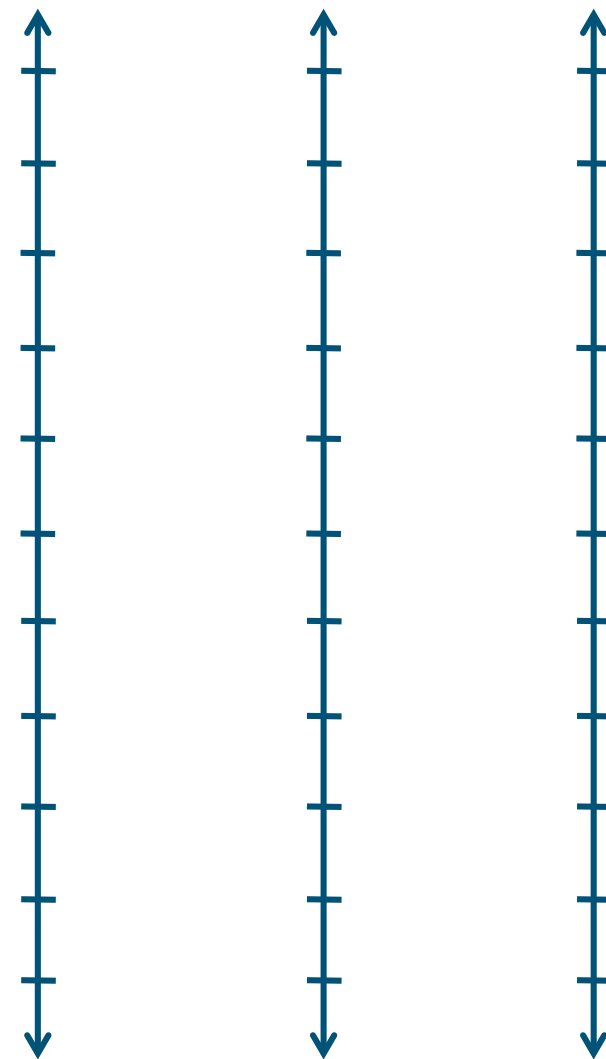
Sea Level

Worksheet 1.2 – Integers and Rational Numbers: Concepts

Here are three vertical number lines that each represent a different situation: temperature, profit/loss (in money) and sea level.

1. Place zero at the center of each number line. Make sure it is the same for each number line.
2. Place each of the following statements as a point on the appropriate number line. (You will need to consider what scale to use for each number line.)

a.	\$2.50	f.	-1.25 feet
b.	3 $\frac{1}{2}$ feet below sea level	g.	-\$3.80
c.	Owe \$3.25	h.	2.7 degrees below zero
d.	4.5 degrees	i.	4.2 feet above sea level
e.	freezing	j.	6 inches below sea level



Temperature
(C°)

Profit/Loss

Sea Level

Worksheet 2.1 – Integers and Rational Numbers: Concepts

Write a statement for each of the points on the number lines.

Temperature

a.

b.

c.

Profit and Loss

a.

b.

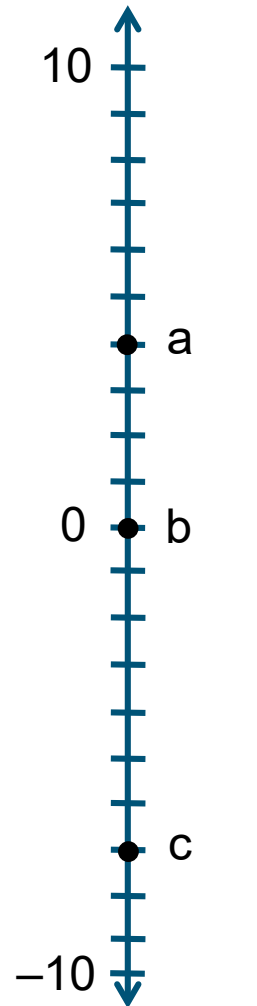
c.

Sea Level

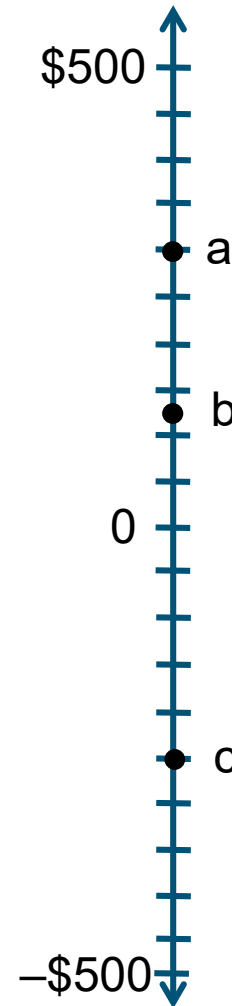
a.

b.

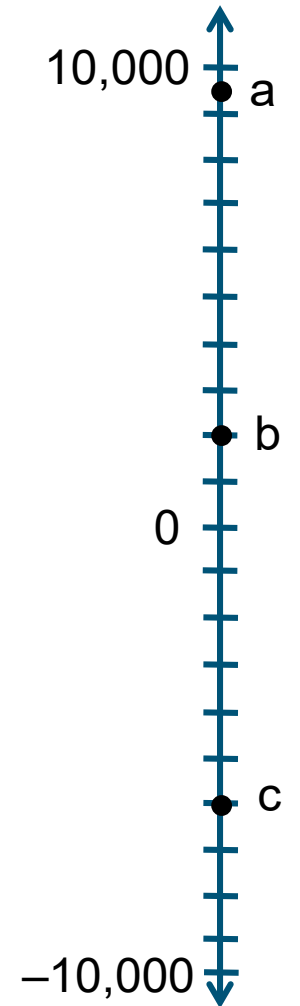
c.



Temperature (C°)



Profit/Loss



Sea Level

Worksheet 2.2 – Integers and Rational Numbers: Concepts

Write a statement for each of the points on the number lines.

Temperature

a.

b.

c.

Profit and Loss

a.

b.

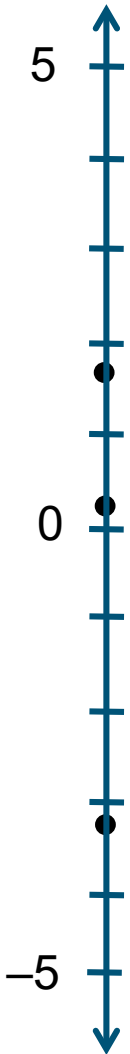
c.

Sea Level

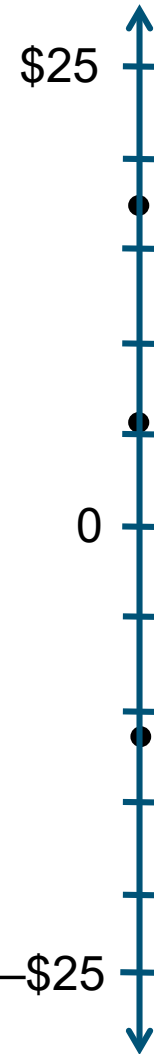
a.

b.

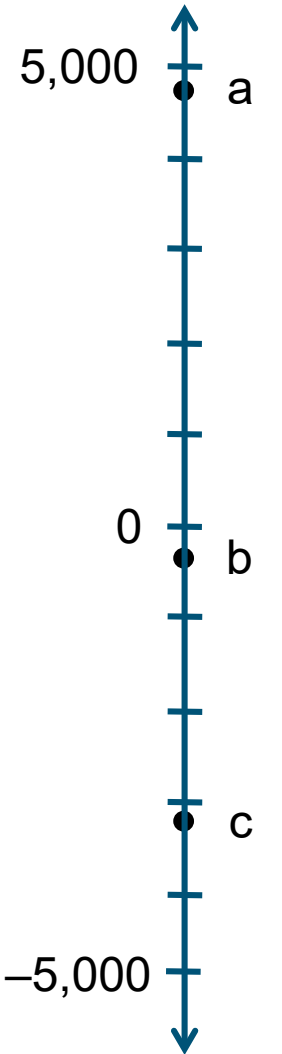
c.



Temperature (C°)



Profit/Loss



Sea Level



“The Developing Mathematical Thinking Institute (DMTI) is dedicated to enhancing students’ learning of mathematics by supporting educators in the implementation of research-based instructional strategies through high-quality professional development, curricular resources and assessments.”

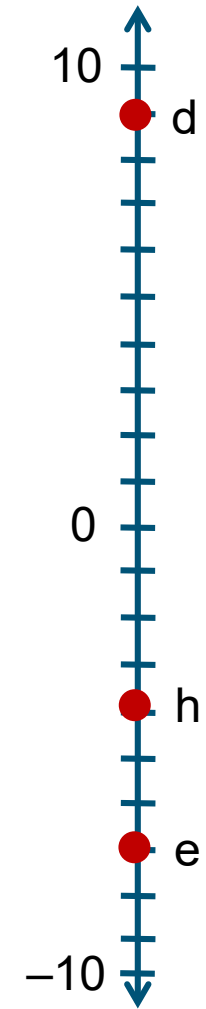
For more information contact
Dr. Brendefur at jbrendefur@dmtinstitute.com



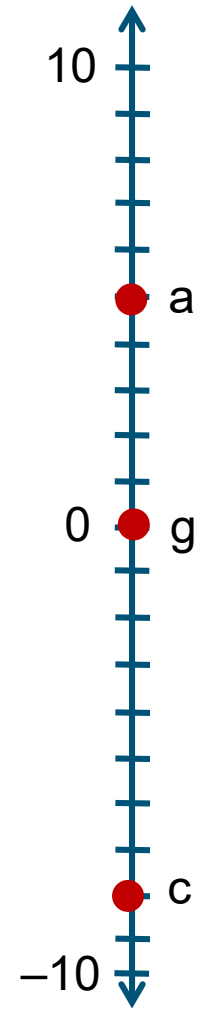
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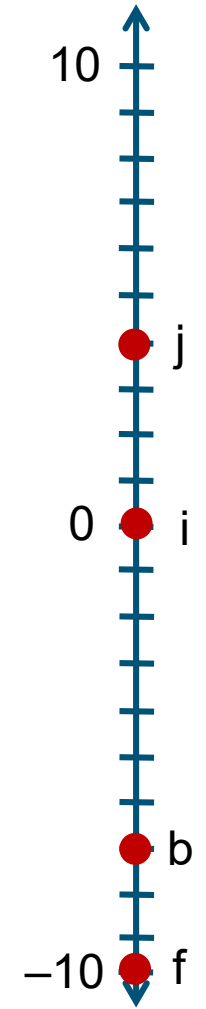
a.	\$5	f.	-10 feet
b.	7 feet below sea level	g.	No Money
c.	Owe \$8	h.	4° below zero
d.	9 degrees	i.	The ocean's surface
e.	7° below zero	j.	4 feet above sea level



Temperature (C°)



Profit/Loss

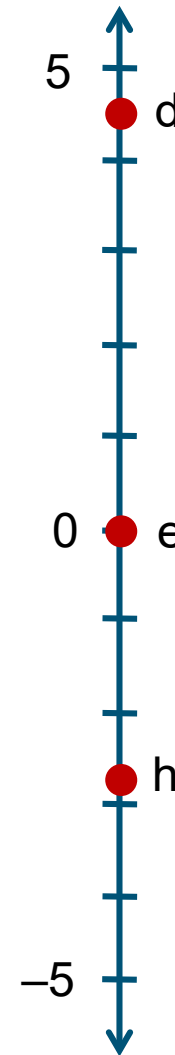


Sea Level

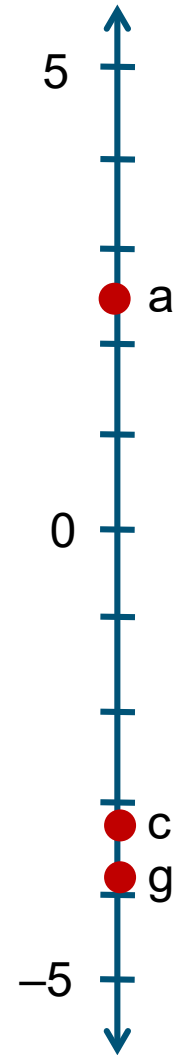
Here are three vertical number lines that each represent a different situation: temperature, profit/loss (in money) and sea level.

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2. Place each of the following statements as a point on the appropriate number line. (You will need to consider what scale to use for each number line)

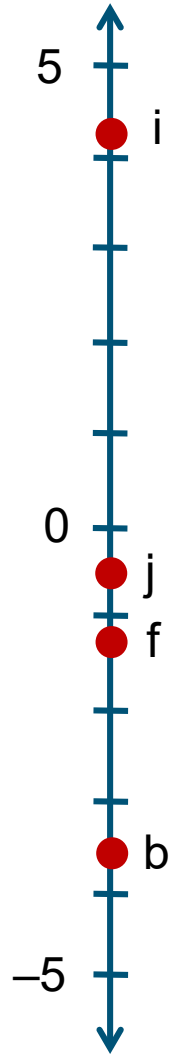
a.	\$2.50	f.	-1.25 feet
b.	3 ½ feet below sea level	g.	-\$3.80
c.	Owe \$3.25	h.	2.7 degrees below zero
d.	4.5 degrees	i.	4.2 feet above sea level
e.	freezing	j.	6 inches below sea level



Temperature
(C°)



Profit/Loss



Sea Level

Write a statement for each of the points on the number lines.

Temperature

- a. 4 degrees
- b. freezing
- c. 7 degrees below 0

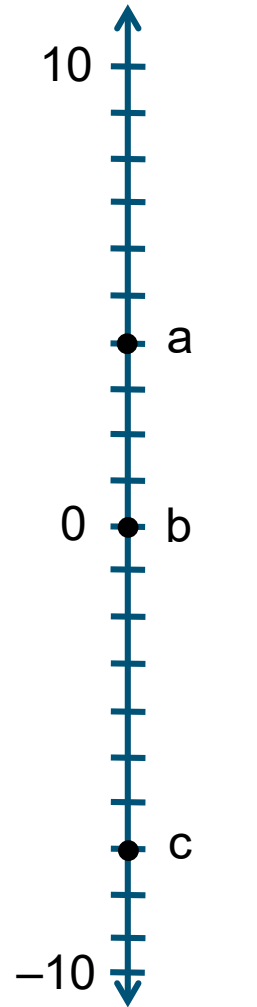
Profit and Loss

- a. \$300
- b. \$125
- c. -\$250

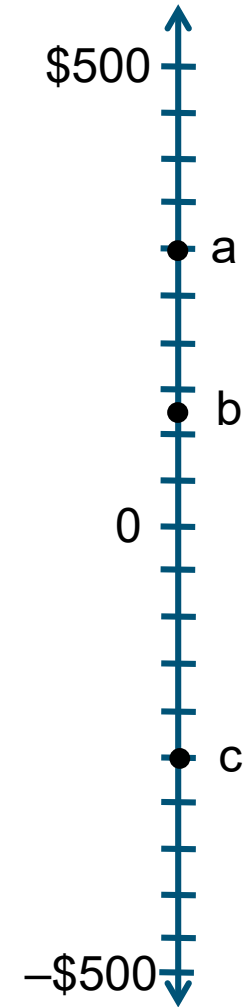
Sea Level

- a. 9500 feet above sea level
- b. 2000 feet above sea level
- c. 6000 feet below sea level

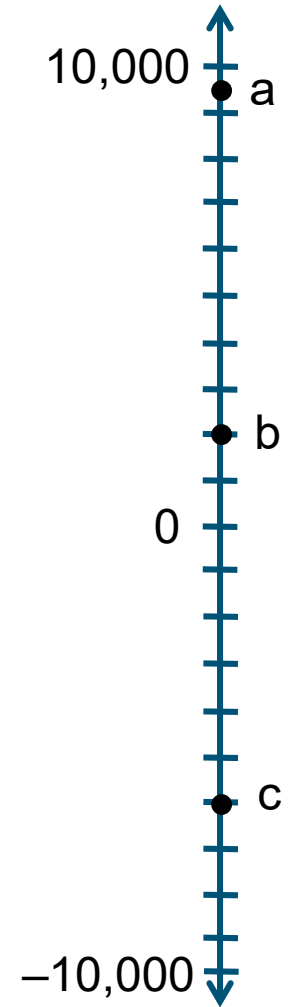
Note: Student answers may vary.
As long as they are reasonable estimates they should be counted as correct.



Temperature
(C°)



Profit/Loss



Sea Level

Write a statement for each of the points on the number lines.

Temperature

- a. $1\frac{3}{4}$ degrees
- b. $\frac{1}{4}$ degree
- c. $-3\frac{1}{4}$ degrees

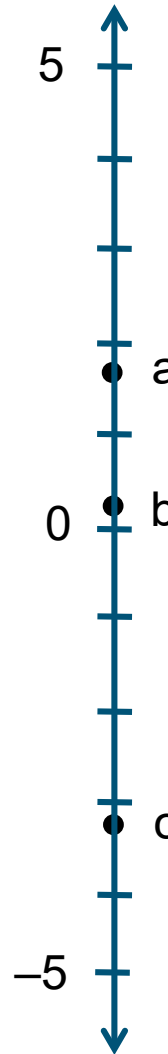
Profit and Loss

- a. \$17.50
- b. \$5.50
- c. -\$11

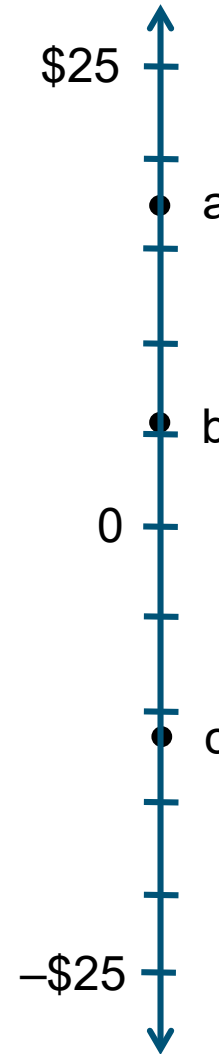
Sea Level

- a. 4800 feet above sea level
- b. 300 feet below sea level
- c. 3200 feet below sea level

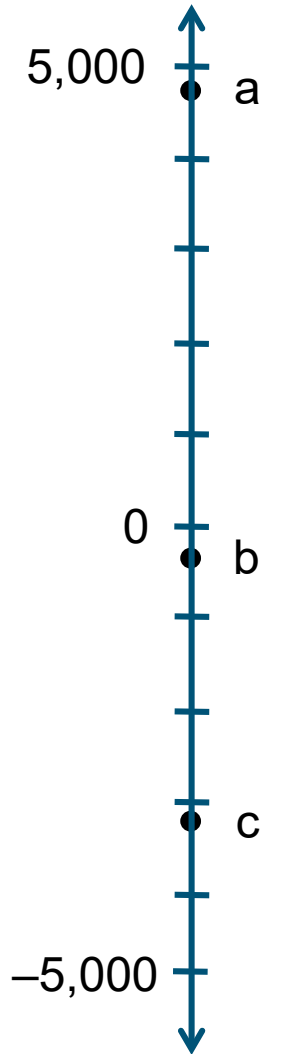
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Temperature (C°)



Profit/Loss



Sea Level