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Resource ID#: 57024

Primary Type: Formative Assessment

# Graphing Points on the Number Line

Students are asked to find the coordinates of graphed points and graph points with rational coordinates on a number line.

**Subject(s):** Mathematics  
**Grade Level(s):** 6  
**Intended Audience:** [Educators](#)

**Freely Available:** Yes

**Keywords:** MFAS, integers, rational, number line, coordinate, plot

**Instructional Component Type(s):** [Formative Assessment](#)

**Resource Collection:** MFAS Formative Assessments

## ATTACHMENTS

[MFAS\\_GraphingPointsOnTheNumberLine\\_Worksheet.docx](#)

## FORMATIVE ASSESSMENT TASK

### Instructions for Implementing the Task

This task can be implemented individually, with small groups, or with the whole class.

1. The teacher asks the student to complete the problems on the Graphing Points on the Number Line worksheet.
2. The teacher asks follow-up questions, as needed.

## TASK RUBRIC

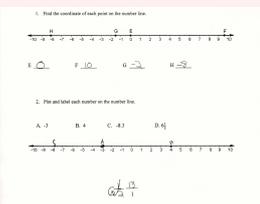
### Getting Started

#### Misconception/Error

The student does not demonstrate an understanding of rational numbers as points on the number line.

#### Examples of Student Work at this Level

The student gives all coordinates as integers.



### Questions Eliciting Thinking

Is F really at 10? Can you look again? How could you describe its location more precisely?

Can coordinates of points be given by fractions or must they be whole numbers?

### Instructional Implications

Review the definition of rational numbers and provide numerous examples of rational numbers initially written as fractions and then written as decimals. Explain to the student that there is a point on the number line for every rational number. Remind the student that the values of numbers get greater as one moves from the left on the number line to the right and that this is true of the negative numbers as well. Also, point out that a number and its opposite are equidistant from zero (e.g., if 8.5 is midway between 8 and 9, then -8.5 is midway between -8 and -9). Ask the student to graph rational numbers, both positive and negative, given in the form of both fractions and decimals. Provide feedback.

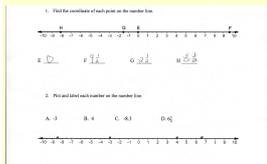
### Moving Forward

#### Misconception/Error

The student incorrectly finds the coordinates of points or incorrectly graphs points with negative rational coordinates.

#### Examples of Student Work at this Level

The student states the coordinate of G is  $-2\frac{1}{2}$  instead of  $-1\frac{1}{2}$ .



### Questions Eliciting Thinking

What is the number that is halfway between 5 and 6? What is the number that is halfway between -5 and -6? Where would this number be located on the number line?

How are the locations on the number line of  $2\frac{1}{2}$  and  $-2\frac{1}{2}$  related?

### Instructional Implications

Make clear that a number and its opposite are equidistant from zero (e.g., if 8.5 is midway between 8 and 9, then -8.5 is midway between -8 and -9). Introduce the concept of absolute value and explain the relationship between the graphs of numbers and their opposites in terms of this concept. Give the student additional opportunities to graph rational numbers and their opposites and guide the student to compare their distances from zero.

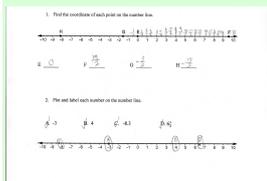
### Got It

#### Misconception/Error

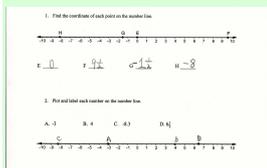
The student provides complete and correct responses to all components of the task.

#### Examples of Student Work at this Level

The student states that the coordinates of the graphed points are E(0), F(approximately 9.6), G(approximately -1.5), H(approximately -8.2) and correctly graphs each point in problem 2.



The student initially describes the coordinate of H as -8 but gives a more precise answer (-8.2) upon questioning.



### Questions Eliciting Thinking

Is point H right at -8? Can you look again? How could you describe its location more precisely?

What if you were asked to graph  $\sqrt{5}$ ? How might you go about doing that?

### Instructional Implications

Engage the student in a discussion of the different ways that the minus or negative symbol is used in mathematics. Encourage the student to interpret expressions such as  $-n$  as meaning "the opposite of n." Ask the student to consider the meaning of numbers such as  $-(-5)$ .

Introduce the concept of absolute value and challenge the student to explain the relationship between the graphs of numbers and their opposites in terms of this concept.

## ACCOMMODATIONS & RECOMMENDATIONS

### Special Materials Needed:

- Graphing Points on the Number Line worksheet

### SOURCE AND ACCESS INFORMATION

Contributed by: MFAS FCRSTEM

Name of Author/Source: MFAS FCRSTEM

District/Organization of Contributor(s): Okaloosa

Is this Resource freely Available? Yes

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### Related Standards

Name	Description
<a href="#">MAFS.6.NS.3.6:</a>	<p>Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates.</p> <ol style="list-style-type: none"><li>Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize that the opposite of the opposite of a number is the number itself, e.g., <math>-(-3) = 3</math>, and that 0 is its own opposite.</li><li>Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes.</li><li>Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane.</li></ol>