# Just In Time Quick Check

## Standard of Learning (SOL) 8.16b

**Strand:** Patterns, Functions, and Algebra

*The student will identify the slope and y-intercept of a linear function given a table of values, a graph, or an equation in $y = mx + b$ form.*

### Grade Level Skills:
- Given a table of values for a linear function, identify the slope and y-intercept. The table will include the coordinate of the y-intercept.
- Given a linear function in the form $y = mx + b$, identify the slope and y-intercept.
- Given the graph of a linear function, identify the slope and y-intercept. The value of the y-intercept will be limited to integers. The coordinates of the ordered pairs shown in the graph will be limited to integers.

### Supporting Resources:
- VDOE Mathematics Instructional Plans (MIPS)
  - [8.16ab - Slope and y-intercept](Word) / [PDF Version]
- VDOE Algebra Readiness Formative Assessments
  - [SOL 8.16b](Word) / [PDF]
- VDOE Algebra Readiness Remediation Plans
  - [Identifying Slope and Y-intercept](Word) / [PDF]
- VDOE Word Wall Cards: Grade 8
  - Slope — Definition
  - Slope
  - Linear Function
  - Identifying Slope and y-Intercept
- Desmos Activity
  - [Put the Point on the Line](Word)
  - [Match My Picture](Word)
  - [Match My Line](Word)
  - [Land the Plane](Word)
  - [Investigating T-Shirt Offers](Word)
  - [Linear Slalom](Word)

### Supporting and Prerequisite SOL:
- [8.16a](Word), [7.10a](Word), [7.10c](Word), [6.1](Word), [6.8b](Word), [6.12a](Word), [6.12b](Word)
SOL 8.16b - Just in Time Quick Check

1. Which is the equation for a line with a slope of -3 and a y-intercept of 4?

   \[ y = -4x + 3 \]
   \[ y = -\frac{3}{4}x + 4 \]
   \[ y = -3x + 4 \]
   \[ y = -\frac{4}{3}x - 3 \]

2. Identify the slope and y-intercept for the linear function represented in the graph.

3. What are the slope and y-intercept for the linear function represented in the table?

<table>
<thead>
<tr>
<th>x</th>
<th>y</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>-2</td>
</tr>
<tr>
<td>-3</td>
<td>-4</td>
</tr>
</tbody>
</table>

Describe how you determined each.
SOL 8.16b - Just in Time Quick Check Teacher Notes

Common Errors/Misconceptions and their Possible Indications

1. Which is the equation for a line with a slope of -3 and a y-intercept of 4?

- $y = -4x + 3$
- $y = -\frac{3}{4}x + 4$
- $y = -3x + 4$
- $y = -\frac{4}{3}x - 3$

A common misconception is for students to reverse the y-intercept and the slope and incorrectly represent the equation as $y = 4x - 3$. These students would benefit from revisiting the Linear Function card in the VDOE Word Wall Cards: Grade 8 to review that the function of a linear equation is written in the form $y = mx + b$ where $m$ represents the slope and $b$ represents the y-intercept.

2. Identify the slope and y-intercept for the linear function represented in the graph.

A common error a student may make is writing the slope as 2. This may indicate that the student believes the slope to be $\frac{\text{change in } y}{\text{change in } x}$ instead of $\frac{\text{change in } x}{\text{change in } y}$. This student may benefit from experiences to build conceptual understanding of slope, perhaps through the use of slope triangles. A teacher may want to refer to the Algebra Readiness Remediation Plan - Slope – Rate of Change in a Proportional Relationship which provides opportunities to develop the concept of slope in a proportional relationship connecting graphs, scenarios, and ratio tables to illustrate the ratio $\frac{\text{change in } y}{\text{change in } x}$. The student may also benefit from opportunities to match the slope and y-intercept to the graph, refer to the VDOE MIP 8.16ab - Slope and y-intercept for a matching activity.
3. What are the slope and $y$-intercept for the linear function represented in the table?

<table>
<thead>
<tr>
<th>$x$</th>
<th>$y$</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>-2</td>
</tr>
<tr>
<td>-3</td>
<td>-4</td>
</tr>
</tbody>
</table>

Describe how you determined each.

A common error is for students to identify the $y$-intercept as 3 (using the coordinate (3,0) from the table) instead of the $y$-intercept of -2. This indicates that the student is looking for a zero value in the table and does not have a strong understanding of the concept of a $y$-intercept. It may also indicate that the student believes since it is called a $y$-intercept, the $y$-value should be zero. These students could benefit from graphing the ordered pairs in the table to see which point lies on the $y$-axis. These students would also benefit from writing the ordered pairs for several points on the $y$-axis and then looking for a pattern to notice that all points that lie on the $y$-axis have an ordered pair of the form $(0, b)$.

Another common error is for students to write the slope as -2, since the $y$-values in the table are decreasing by 2 in each row. This may indicate that students assume the change in $x$ is 1, if their experiences have only included tables that show the $x$-values increasing by 1. These students would benefit from graphing the points from the table on a coordinate grid and using slope-triangles to find the ratio of the vertical change to the horizontal change. Providing opportunities for students to determine slope from a variety of tables, including those where the change in $x$-values is not 1 as well as those where the change in $x$-values is not consistent throughout the table would also benefit students.