

Just In Time Quick Check
Standard of Learning (SOL) A.7c

Strand: Functions

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The student will investigate and analyze linear and quadratic function families and their characteristics both algebraically and graphically, including zeros.

Grade Level Skills:

- Identify the domain, range, zeros, and intercepts of a function presented algebraically or graphically.
- Use the x-intercepts from the graphical representation of a quadratic function to determine and confirm its factors.
- Investigate and analyze characteristics and multiple representations of functions with a graphing utility.

Just in Time Quick Check

Just in Time Quick Check Teacher Notes

Supporting Resources:

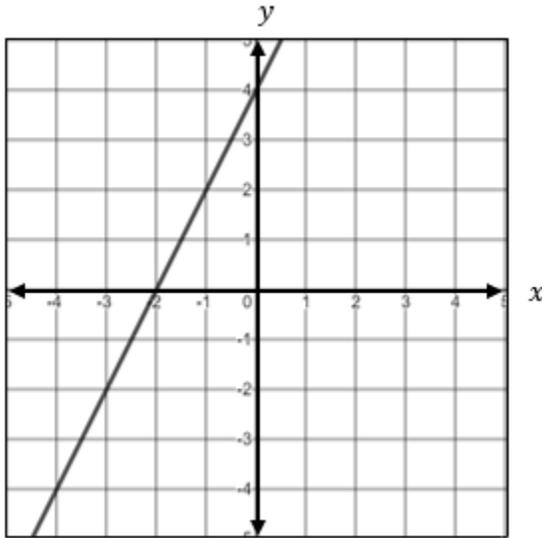
- VDOE Mathematics Instructional Plans (MIPS)
 - [A.7bcd - Functions 2: Exploring Quadratic Functions](#) (Word) / [PDF Version](#)
 - [A.7cd - Quadratic Connections](#) (Word) / [PDF Version](#)
 - [A.7cd - Solving Linear Equations Using Functions with Desmos](#) (Word) / [PDF Version](#)
- VDOE Algebra Readiness Formative Assessments
 - [A.7c,d](#) (Word) / [PDF](#)
- VDOE Word Wall Cards: Algebra I ([Word](#)) | ([PDF](#))
 - Solutions or Roots, Zeros, x-Intercepts
 - Parent Functions - Linear, Quadratic
- VDOE Rich Mathematical Tasks: The Soccer Competition
 - [A.7 The Soccer Competition Task Template](#) (Word) / [PDF Version](#)
- Desmos Activities
 - [Transforming Lines](#)
 - [Two Truths and a Lie: Quadratics](#)
 - [What's My Transformation?](#)
 - [Polygraph: Parabolas and Polygraph: Parabolas Part 2](#)
 - [Polygraph: Quadratics](#)
 - [Will It Hit the Hoop?](#)

Supporting and Prerequisite SOL: [A.1b](#), [A.2c](#), [A.4b](#), [A.7b](#)

SOL A.7c - Just in Time Quick Check

1) What is the zero of $f(x) = -\frac{2}{3}x + 4$?

2) The graph of $y = 2x + 4$ is shown. What is the solution to $2x + 4 = 0$?



3) What are the root(s) of the function $f(x) = 2x^2 - x - 6$?

4) If a second-degree polynomial function with a leading coefficient of 1 has zeros of $x = 3$ and $x = -2$, what is the factored form of this function?

5) Let $g(x) = \frac{1}{2}x - 3$ and $h(x) = 3x + k$. For what value of k is the zero of $h(x)$ equivalent to the zero of $g(x)$?

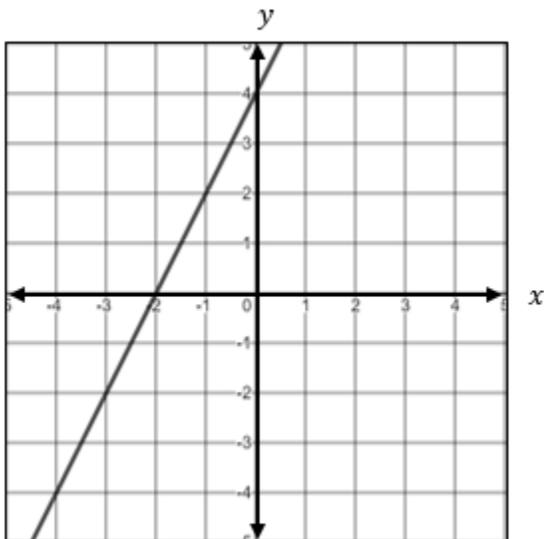
SOL A.7c - Just in Time Quick Check Teacher Notes

Common Errors/Misconceptions and their Possible Indications

- 1) What is the zero of $f(x) = -\frac{2}{3}x + 4$?

A common error would be for a student to replace x with 0 instead of replacing y . This indicates a misunderstanding that a zero is the value where the function is set equal to zero. A strategy that could be used is to graph the function to show where it crosses the x -axis is also where the function is equal to 0.

- 2) The graph of $y = 2x + 4$ is shown. What is the solution to $2x + 4 = 0$?



A common error would be for a student to include the y -intercept as a zero of the function. This indicates a misunderstanding that zeros are both x and y -intercepts. The definition of zero should be reviewed with the student. A strategy that could be used is to list the intercepts as a set of ordered pairs or as a table to demonstrate that only the x -intercept value is where the entire function is equal to zero.

- 3) What are the root(s) of the function $f(x) = 2x^2 - x - 6$?

A common error is for a student to only list the positive zero of 2 instead of both the positive and negative zero. This indicated a misconception that there can be more than one zero and zeros can be positive or negative values. A strategy that could be used is the graph the function using Desmos or graph paper and show how at both zeros the function is equal to zero.

- 4) If a second-degree polynomial function with a leading coefficient of 1 has zeros of $x = 3$ and $x = -2$, what is the factored form of this function?

A common error a student may make is to write the factored form as $f(x) = (x + 3)(x - 2)$. This indicates a misunderstanding of the connection between x -intercepts and factors. A strategy that could be used is to review the connection between factors and solutions. This could be done algebraically or graphically.

- 5) Let $g(x) = \frac{1}{2}x - 3$ and $h(x) = 3x + k$. For what value of k is the zero of $h(x)$ equivalent to the zero of $g(x)$?

A common error would be for a student to say that $k = 6$, which is the zero of $g(x)$. This indicates the student would benefit from additional practice in comparing functions and working with constant variable terms. A strategy that could be used is for the students to experiment with the slider feature in Desmos to demonstrate what happens to the graph and equation of $h(x)$ as k changes in value.