# Just In Time Quick Check <br> Standard of Learning (SOL) A.7c 

## Strand: Functions

## Standard of Learning (SOL) A.7c

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

3) What are the root(s) of the function $f(x)=2 x^{2}-x-6$ ?
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 $h(x)=3 x+k$. 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 $y=2 x+4$ is shown. What is the solution to $2 x+4=0$ ?


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 $f(x)=2 x^{2}-x-6$ ?

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 $h(x)=3 x+k$. 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.

