Just In Time Quick Check

[Standard of Learning (SOL) A.7](https://www.doe.virginia.gov/home/showpublisheddocument/2866/637982462406870000)c

| Strand:Functions |
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| 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.
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| [**Just in Time Quick Check**](#bookmark=id.gjdgxs) |
| [**Just in Time Quick Check Teacher Notes**](#teacher) |
| Supporting Resources: * VDOE Mathematics Instructional Plans (MIPS)
	+ [A.7bcd - Functions 2: Exploring Quadratic Functions](https://www.doe.virginia.gov/home/showpublisheddocument/15956/638035206233170000) (Word) / [PDF Version](https://www.doe.virginia.gov/home/showpublisheddocument/15958/638035206239270000)
	+ [A.7cd - Quadratic Connections](https://www.doe.virginia.gov/home/showpublisheddocument/15964/638035206254730000) (Word) / [PDF Version](https://www.doe.virginia.gov/home/showpublisheddocument/15966/638035206260970000)
	+ [A.7cd - Solving Linear Equations Using Functions with Desmos](https://www.doe.virginia.gov/home/showpublisheddocument/15960/638035206243970000) (Word) / [PDF Version](https://www.doe.virginia.gov/home/showpublisheddocument/15962/638035206249570000)
* VDOE Algebra Readiness Formative Assessments
	+ [A.7c,d](https://www.doe.virginia.gov/home/showpublisheddocument/30986/638046554983300000) (Word) / [PDF](https://www.doe.virginia.gov/home/showpublisheddocument/30988/638046554989270000)
* VDOE Word Wall Cards: Algebra I   [(Word)](https://www.doe.virginia.gov/home/showpublisheddocument/18630/638041054191430000)  |  [(PDF)](https://www.doe.virginia.gov/home/showpublisheddocument/18628/638041054182370000)
	+ Solutions or Roots, Zeros, x-Intercepts
	+ Parent Functions - Linear, Quadratic
* VDOE Rich Mathematical Tasks: The Soccer Competition
	+ [A.7 The Soccer Competition Task Template](https://www.doe.virginia.gov/home/showpublisheddocument/26568/638045686349330000) (Word) / [PDF Version](https://www.doe.virginia.gov/home/showpublisheddocument/26570/638045686354630000)
* Desmos Activities
	+ [Transforming Lines](https://teacher.desmos.com/activitybuilder/custom/5beeffea3d231b0c5a36db5f)
	+ [Two Truths and a Lie: Quadratics](https://teacher.desmos.com/activitybuilder/custom/5d337131828b87201c4ca136)
	+ [What’s My Transformation?](https://teacher.desmos.com/activitybuilder/custom/56001cb3ccac42274a00be25)
	+ [Polygraph: Parabolas](https://teacher.desmos.com/polygraph-parabolas) and [Polygraph: Parabolas Part 2](https://teacher.desmos.com/activitybuilder/custom/574f12421390db611564fa32)
	+ [Polygraph: Quadratics](https://teacher.desmos.com/polygraph/custom/5bbb6c34ac8e9f0b29fcdbb8)
	+ [Will It Hit the Hoop?](https://teacher.desmos.com/activitybuilder/custom/56e0b6af0133822106a0bed1)
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| **[Supporting and Prerequisite SOL](https://www.doe.virginia.gov/teaching-learning-assessment/k-12-standards-instruction/mathematics/instructional-resources/just-in-time-mathematics-quick-checks)**: [A.1b](https://www.doe.virginia.gov/home/showpublisheddocument/25352/638045617786030000), [A.2c](https://www.doe.virginia.gov/home/showpublisheddocument/25364/638045617817630000), [A.4b](https://www.doe.virginia.gov/home/showpublisheddocument/25384/638045617867000000), [A.7b](https://www.doe.virginia.gov/home/showpublisheddocument/25432/638045619538500000) |

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 $2x+4=0$?



1. What are the root(s) of the function $f\left(x\right)=2x^{2}-x-6$?
2. 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?
3. Let $g\left(x\right)=\frac{1}{2}x-3$ and $h\left(x\right)=3x+k$. 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.*

1. 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 $f\left(x\right)=2x^{2}-x-6$?

*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.*

1. 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* $f\left(x\right)=(x+3)(x-2)$*. 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 $g\left(x\right)=\frac{1}{2}x-3$ and $h\left(x\right)=3x+k$. 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.*