Just In Time Quick Check

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

| Strand:Functions |
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| Standard of Learning (SOL) A.7b *The student will investigate and analyze linear and quadratic function families and their characteristics both algebraically and graphically, including domain and range.* |
| Grade Level Skills: * Identify the domain, range, zeros, and intercepts of a function presented algebraically or graphically.
* 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.7abef - Functions 1: Investigating Relations and Functions](https://www.doe.virginia.gov/home/showpublisheddocument/15948/638035206210500000) (Word) / [PDF Version](https://www.doe.virginia.gov/home/showpublisheddocument/15950/638035206218170000)
	+ [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)
* VDOE Algebra Readiness Formative Assessments
	+ [A.7a,b,e](https://www.doe.virginia.gov/home/showpublisheddocument/30982/638046554973770000) (Word) / [PDF](https://www.doe.virginia.gov/home/showpublisheddocument/30984/638046554978930000)
* 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)
	+ Domain
	+ Range
* 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)
	+ [Free-Range Functions](https://teacher.desmos.com/activitybuilder/custom/5613ebbd768a8afa0fdf9f62)
	+ [Function Representation Card Sort](https://teacher.desmos.com/activitybuilder/custom/5be9bc333ab70b1f57953bfc)
	+ [Polygraph: Parabolas](https://teacher.desmos.com/polygraph-parabolas)
	+ [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)**: [8.15b](https://www.doe.virginia.gov/home/showpublisheddocument/25316/638045435969400000) |

SOL A.7b - Just in Time Quick Check

1. What appears to be the domain of the relation shown?

$$x$$

$$y$$

1. $\{y|-8\leq y\leq 5\}$
2. $\{x|-7\leq x\leq 7\}$
3. $\{y|y=-8, -4, 1, 2, 5\}$
4. $\{x|x=-7, -3, 0, 4, 7\}$

2) What is the domain of the function shown?



3) Write the range of the function $f\left(x\right)=-\left(x+4\right)^{2}-3$ using set notation below.

The range of $f(x)$ is $\{y|y\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\}$.

4) Draw a line segment that represents a relation with:

**Domain:** the set of all real numbers greater than or equal to -3 and less than

 or equal to 2

**Range:** the set of all real numbers greater than or equal to -4 and less than

 or equal to 1

$$x$$

$$y$$

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

**Common Errors/Misconceptions and their Possible Indications**

1) What appears to be the domain of the relation shown?

$$x$$

$$y$$

1. $\{y|-8\leq y\leq 5\}$
2. $\{x|-7\leq x\leq 7\}$
3. $\{y|y=-8, -4, 1, 2, 5\}$
4. $\{x|x=-7, -3, 0, 4, 7\}$

*A common error a student may make is to list the domain as* $-7\leq x\geq 7$ *instead of as discrete values. This indicates the student does not recognize the difference between a list of discrete values and a range of values. A strategy that could be used is to review inequalities on a number line to indicate how they cover a range of values. Desmos could be used as a visual representation of how the range of values covers more than just the discrete list would.*

2) What is the domain of the function shown?

*A common error would be for a student to list the domain as -4 and 0 or between -4 and 0. This indicates a misunderstanding of domain for x-intercepts. The teacher should review with the student that while x-intercepts are part of the domain, the domain is the set of all possible values of the independent variable. Listing additional ordered pairs from the graph in a set or table may help visualize this.*

3) Write the range of the function $f\left(x\right)=-\left(x+4\right)^{2}-3$ in set notation below.

The range of $f(x)$ is $\{y|y\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\}$.

*A common error a student may make is to say the range is less than or equal to -4, the x-coordinate of the vertex. This indicates the student has a misconception in associating domain and range with the independent and dependent variables respectively. A strategy that could be used is to have the student practice with discrete points in identifying the domain and range and then continue practice with continuous graphs.*

4) Draw a line segment that represents a relation with:

**Domain:** the set of all real numbers greater than or equal to -3 and less than

 or equal to 2

**Range:** the set of all real numbers greater than or equal to -4 and less than

 or equal to 1

*A common error a student may make is to use the restricted domain and range intervals as coordinates and plot (-3, 2) and (-4, 1) as the endpoints of the line segment. This indicates the student understands the association of the domain with the x-coordinate and range with the y-coordinate, but does not understand how to apply domain and range restrictions to a line segment. A strategy that could be used is to use graph paper and post-its or graphing technology to visualize restricting the domain and range one interval at a time to show how the line segment endpoints need to be where the restrictions coincide.*