

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

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 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.

Just in Time Quick Check

Just in Time Quick Check Teacher Notes

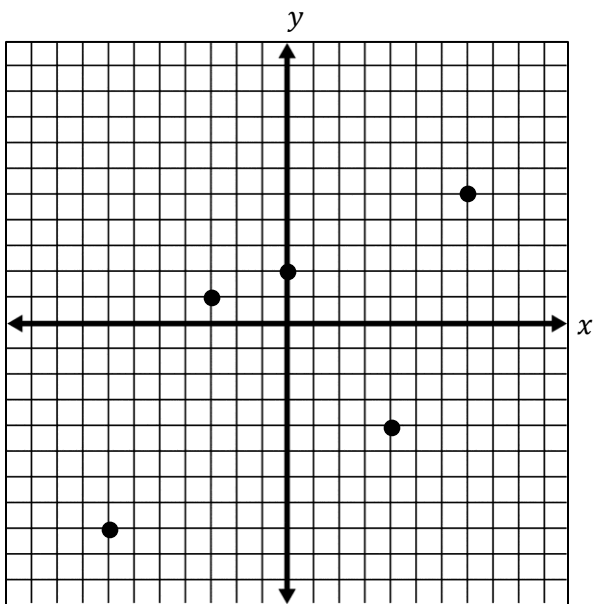
Supporting Resources:

- VDOE Mathematics Instructional Plans (MIPS)
 - [A.7abef - Functions 1: Investigating Relations and Functions](#) (Word) / [PDF Version](#)
 - [A.7bcd - Functions 2: Exploring Quadratic Functions](#) (Word) / [PDF Version](#)
- VDOE Algebra Readiness Formative Assessments
 - [A.7a,b,e](#) (Word) / [PDF](#)
- VDOE Word Wall Cards: Algebra I [\(Word\)](#) | [\(PDF\)](#)
 - Domain
 - Range
- 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?](#)
 - [Free-Range Functions](#)
 - [Function Representation Card Sort](#)
 - [Polygraph: Parabolas](#)
 - [Polygraph: Parabolas Part 2](#)
 - [Polygraph: Quadratics](#)
 - [Will It Hit the Hoop?](#)

Supporting and Prerequisite SOL: 8.15b

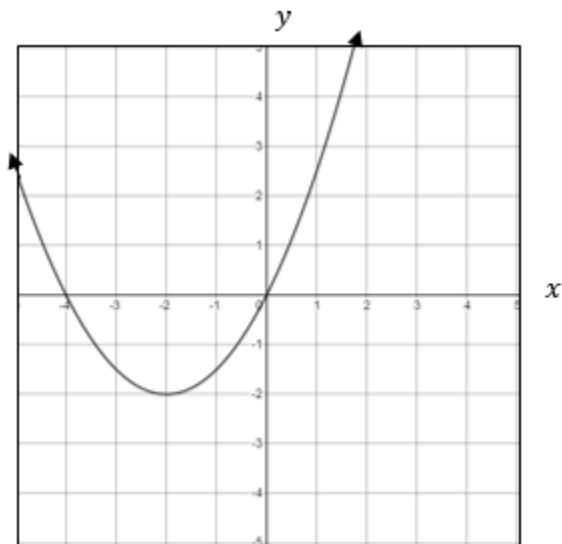
SOL A.7b - Just in Time Quick Check

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



- A. $\{y \mid -8 \leq y \leq 5\}$
- B. $\{x \mid -7 \leq x \leq 7\}$
- C. $\{y \mid y = -8, -4, 1, 2, 5\}$
- D. $\{x \mid x = -7, -3, 0, 4, 7\}$

2) What is the domain of the function shown?



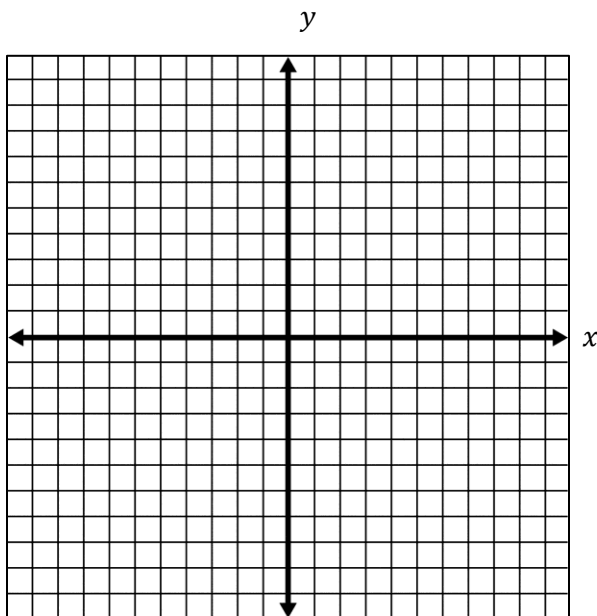
- 3) Write the range of the function $f(x) = -(x + 4)^2 - 3$ using set notation below.

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

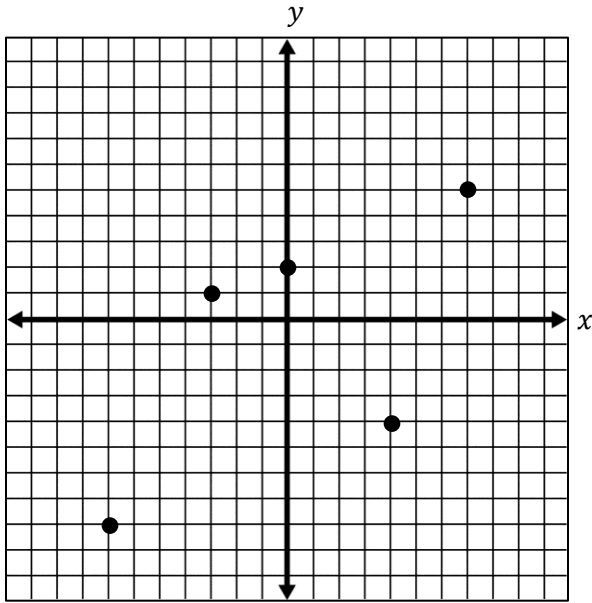
Range: the set of all real numbers greater than or equal to -4 and less than or equal to 1



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?



- A. $\{y \mid -8 \leq y \leq 5\}$
- B. $\{x \mid -7 \leq x \leq 7\}$
- C. $\{y \mid y = -8, -4, 1, 2, 5\}$
- D. $\{x \mid x = -7, -3, 0, 4, 7\}$

A common error a student may make is to list the domain as $-7 \leq x \leq 7$ 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 $f(x) = -(x + 4)^2 - 3$ 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.