

Restricting Domain { 5.4 }

Secondary Math II Notes

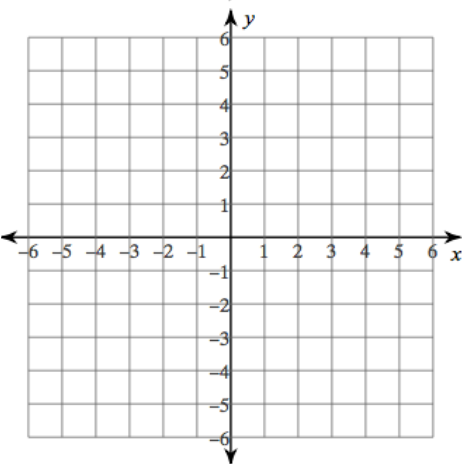
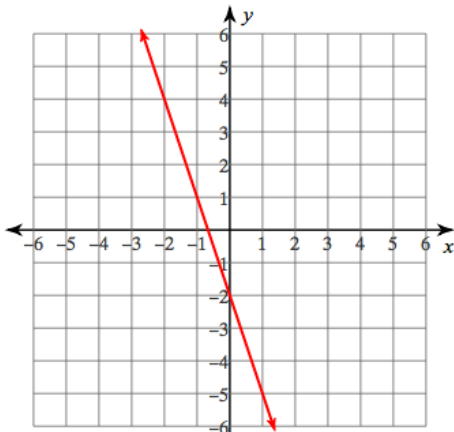
OBJECTIVE: Sketch graphs of functions with various domain restrictions. Determine an appropriate set of numbers for the domain of a function that models a specific context.

Sketching Graphs with Domain Restrictions

Below is the function $f(x) = -3x - 2$

Graph the function again with the following domain:

$$D = \{x \mid -2 \leq x < 1\}$$

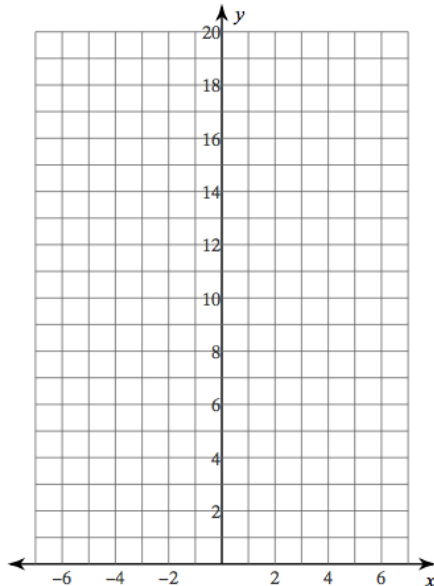
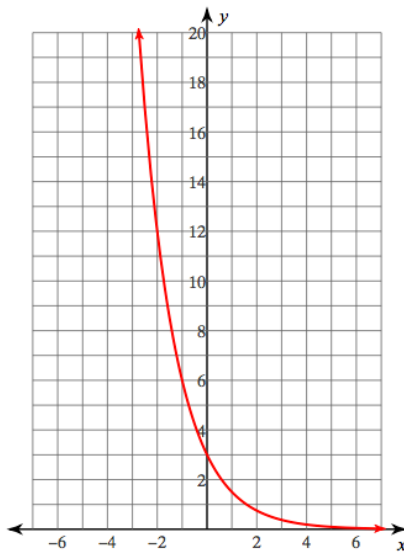


The graph would be the same except it would only go as far left as -2 which a closed point there, and as far right as 1 with an open point there.

Below is the function $f(x) = 3\left(\frac{1}{2}\right)^x$

Graph the function again with the following domain:

$$D = \{-2, -1, 0, 1\}$$



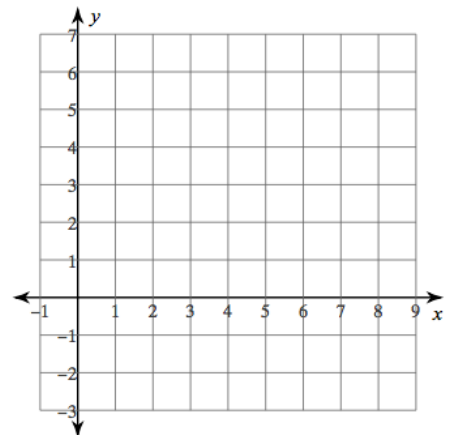
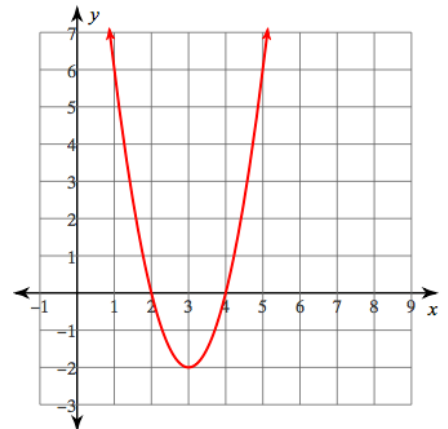
The graph would only consist of 4 points: $(-2, 12)$ $(-1, 6)$ $(0, 3)$ and $(1, 3/2)$.

Below is the function

$$f(x) = 2x^2 - 12x + 16$$

Graph the function again with the following domain:

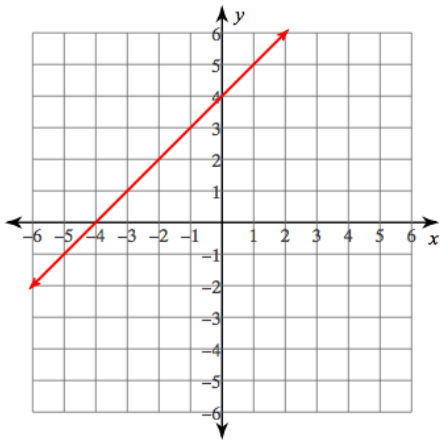
$$D = (-\infty, 2) \cup [4, \infty)$$



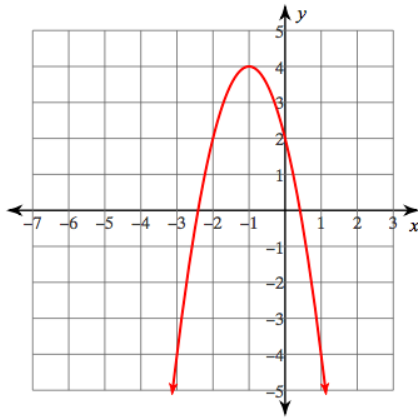
The graph would be the same except it would only include the portions that are above the x-axis with an open point at $(2, 0)$ and a closed point at $(4, 0)$.

Determining Domain Restrictions

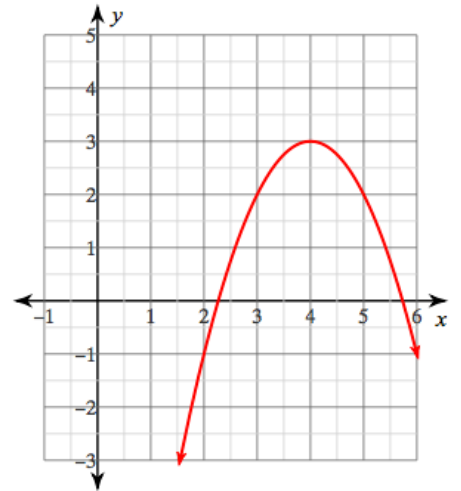
Johnny works as a sandwich delivery boy. He is paid \$4 for the use of his car and is paid an additional \$1 for every sandwich he delivers. Below is the graph of a function that models the situation. Restrict the domain to provide the most accurate representation of the scenario.
 $D = \{0, 1, 2, 3, \dots\}$



An object is launched with a downward velocity from a height of 2 meters. It hits the ground at 0.4 seconds. Below is the graph of a function that models the situation. Restrict the domain to provide the most accurate representation of the scenario.
 $D = [0, 0.4]$



A company is trying to determine the price at which to sell their product. Below is the graph that gives the Revenue (in thousands of dollars) as a function of the price of the product. Restrict the domain to provide the most accurate representation of the scenario.
 $D = [0, 0.01, 0.02, 0.03, \dots]$



CHALLENGE

This is the graph of a circle. It is NOT a function.
 For which restricted domain below would this graph be a function?

- A. Such a domain does not exist.
- B. $\{-3, 3\}$
- C. $\{x \mid -3 \leq x \leq 3\}$
- D. All real numbers

The correct answer is B, because at -3 and 3 the graph would only consist of two points and would be a function.

