

Key Terms/Vocabulary

Invariant Points : *A point on a graph that remains unchanged after a transformation is applied to it.*

Vertical Asymptote

Horizontal Asymptote

Hole

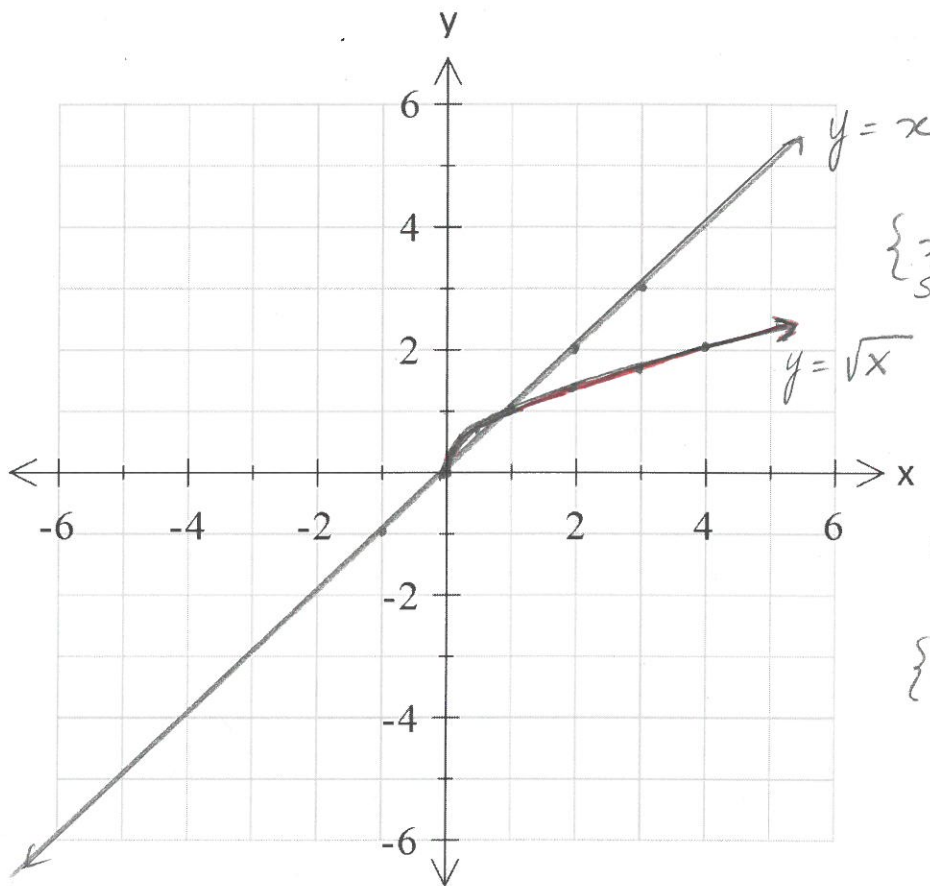
Non-permissible Value

Lesson 1: Sketch the Graph of the Radical Function $y = \sqrt{x}$ $y = \sqrt{f(x)}$

Example 1: Sketch the graphs of $y = x$ and $y = \sqrt{x}$ using a table of values on the same grid. State the domains and ranges of both. Identify any invariant points.

Graph

x	-1	0	0.25	0.5	1	2	3	4
$y = x$	-1	0	0.25	0.5	1	2	3	4
$y = \sqrt{x}$	—	0	0.5	0.707	1	1.41	1.73	2

Domain of $y = x$:

$$\{x \mid x \in \mathbb{R}\} \quad (-\infty, \infty)$$

set notation interval notation

Range of $y = x$:

$$\{y \mid y \in \mathbb{R}\} \quad (-\infty, \infty)$$

Domain $y = \sqrt{x}$:

$$\{x \mid x \geq 0\} \quad [0, \infty)$$

Range $y = \sqrt{x}$:

$$\{y \mid y \geq 0\} \quad [0, \infty)$$

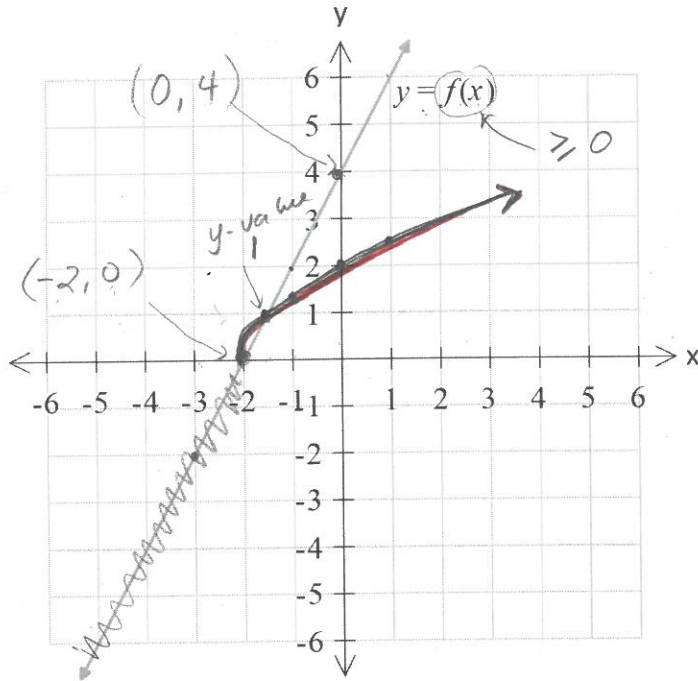
Additional Notes:

A Radical Function has the form $y = \sqrt{f(x)}$, where $f(x)$ is a function. The square root of a number is only defined for non-negative numbers, so the domain of $y = \sqrt{f(x)}$ is a set of values of x for which $f(x) \geq 0$.

Lesson 2: Square Root of a Function

Example 1: Given the graph of $y = f(x)$, where $f(x)$ is a linear function, sketch the graph of $y = \sqrt{f(x)}$. State the domain and range.

a)

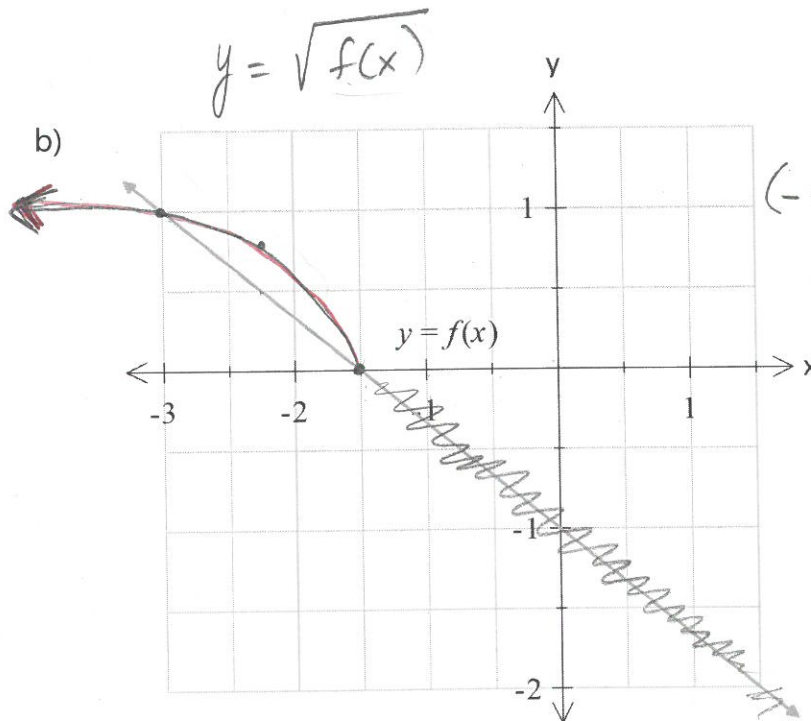


Domain:
 $[-2, \infty)$ or $\{x \mid x \geq -2\}$

Range:

$[0, \infty)$ or $\{y \mid y \geq 0\}$

b)



Domain:

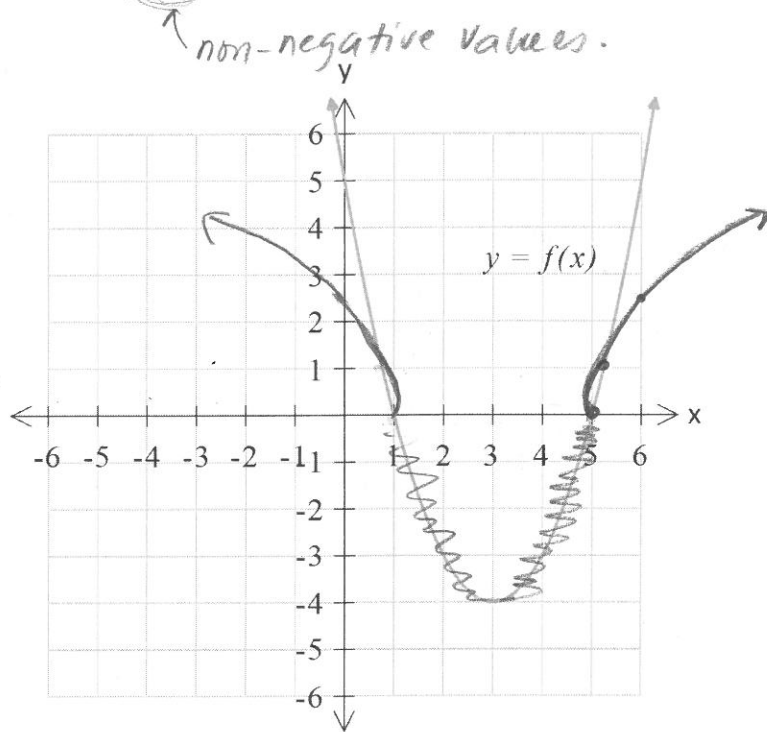
$(-\infty, -1.5]$ or $\{x \mid x \leq -1.5\}$

Range:

$[0, \infty)$ or $\{y \mid y \geq 0\}$

Example 2: Given the graph of $y = f(x)$, where $f(x)$ is a quadratic function, sketch the graph of $y = \sqrt{f(x)}$. State the domain and range.

a)

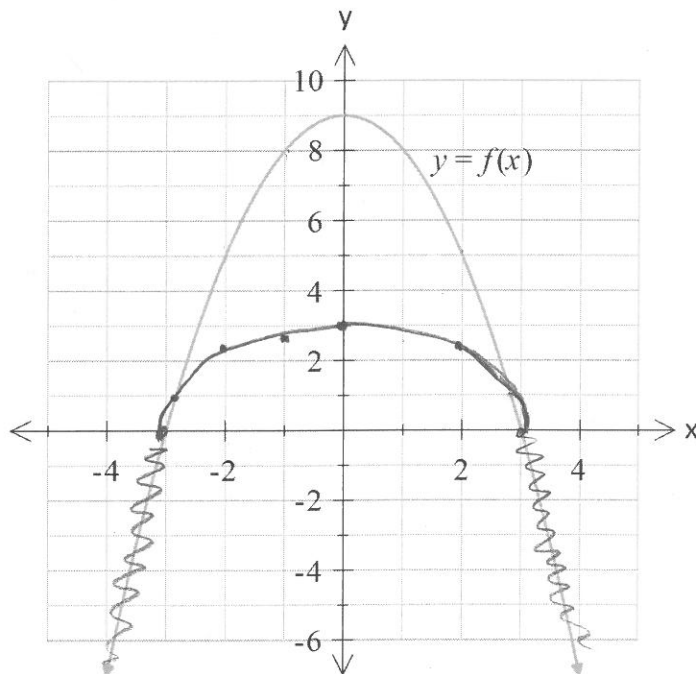


Domain: $(-\infty, 1] \cup [5, \infty)$
 $\{x \mid x \leq 1 \cup x \geq 5\}$

Range: $[0, \infty)$

$\{y \mid y \geq 0\}$

b)

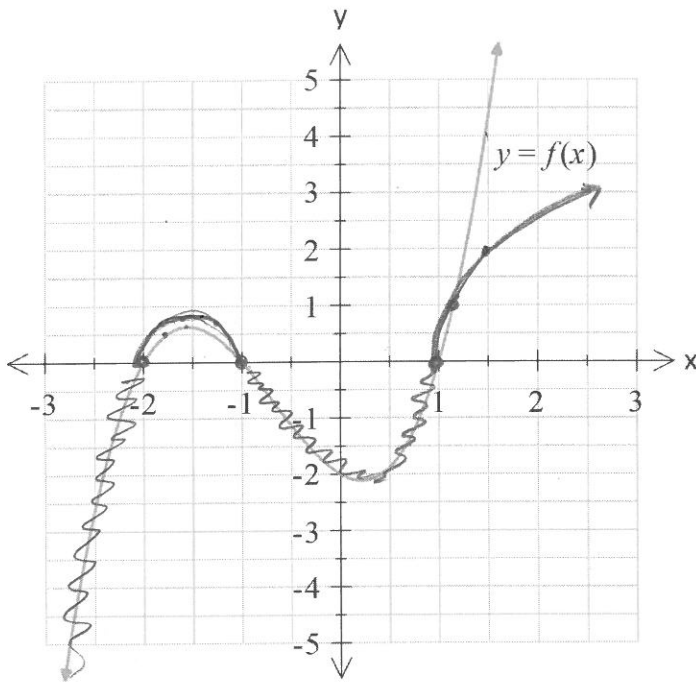


Domain: $[-3, 3]$
 $\{x \mid -3 \leq x \leq 3\}$

Range: $[0, 3]$

$\{y \mid 0 \leq y \leq 3\}$

Example 3: Given the graph of $y = f(x)$, where $f(x)$ is a cubic function, sketch the graph of $y = \sqrt{f(x)}$. State the domain and range.



Domain $[-2, -1] \cup [1, \infty)$

$$\{x \mid -2 \leq x \leq -1 \cup x \geq 1\}$$

Range: $[0, \infty)$

$$\{y \mid y \geq 0\}$$

Assignment Time! Work on p.90- 5, 7, 8, 10, 11*, 12, MC 1&2