

Name:

Date:

Period:

3.5 Square Root Function Notes

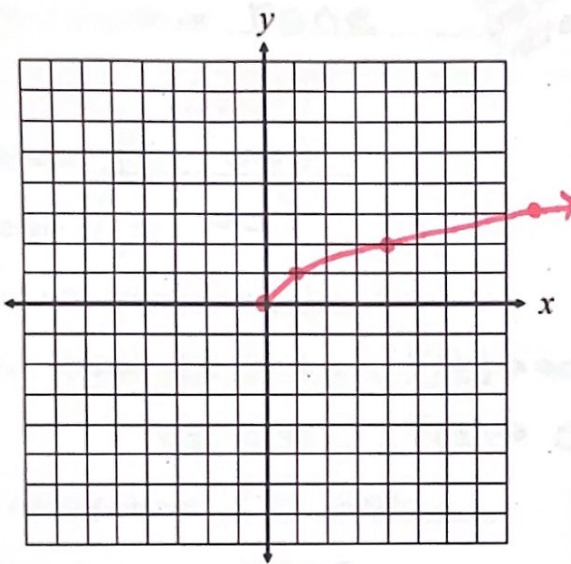
Square Root

A Radical Function is a function of the form $f(x) = \sqrt[n]{x}$

$$f(x) = \sqrt{x}$$

The Square Root Function is a type of radical function.

Graph the parent function of the Square Root Function.



Domain $[0, \infty)$ Range $[0, \infty)$

End point/locator point (h,k) $(0,0)$

End behavior

$$\text{as } x \rightarrow \infty, f(x) \rightarrow \infty$$

$$\text{as } x \rightarrow 0, f(x) \rightarrow 0$$

The value(s) of x that cause y to increase
Increasing interval(s) $(0, \infty)$

The value(s) of x that cause y to decrease
Decreasing interval(s) none

Graphing Form: $f(x) = a\sqrt{x-h} + k$

Directions: Describe the transformation compared to the parent.

1. $f(x) = \sqrt{x-7} + 2$
 h k

It shifts 7 units right and 2 units up.

2. $f(x) = \frac{1}{2}\sqrt{x-2} - 6$

It shifts 2 units right, shifts 6 units down, and compresses vertically by a factor of 1/2.

3. The square root function is reflected across the x axis, shifted 7 units left and 1 unit down. Write the function that represents this situation.

$$f(x) = -\sqrt{x+7} - 1$$

4. The square root function is stretched vertically by a factor of 3 and shifted 2 units right. Write the function that represents this situation.

$$f(x) = 3\sqrt{x-2}$$

① Plot (h,k)

5. $f(x) = \sqrt{x-1} - 4$

Domain: $[1, \infty)$

Range: $[-4, \infty)$

End point/locator point: $(1, -4)$

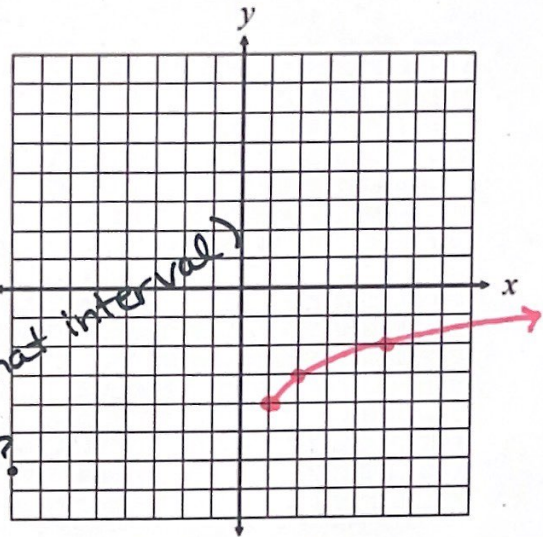
End behavior: $\text{As } x \rightarrow \infty, f(x) \rightarrow \infty$

$\text{As } x \rightarrow 1, f(x) \rightarrow -4$

Increasing interval: $(1, \infty)$

Decreasing interval: none

Where (what interval) does x make y increase?



6. $f(x) = 3\sqrt{x+1}$

Domain: $[-1, \infty)$

Range: $[0, \infty)$

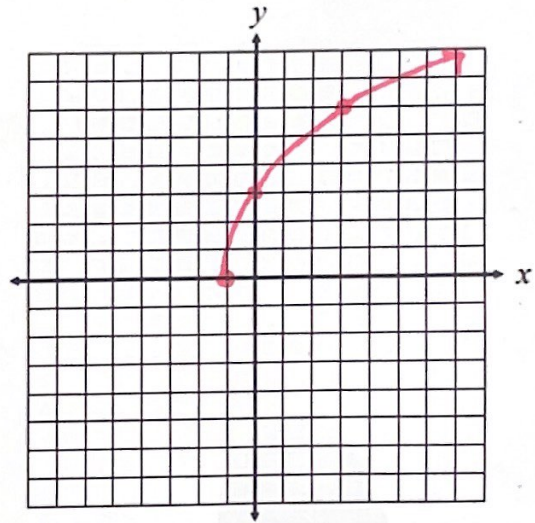
End point/locator point: $(-1, 0)$

End behavior: $\text{as } x \rightarrow \infty, f(x) \rightarrow \infty$

$\text{as } x \rightarrow -1, f(x) \rightarrow 0$

Increasing interval: $(-1, \infty)$

Decreasing interval: none



7. $f(x) = -\sqrt{x-2} + 3$

Domain: $[2, \infty)$

Range: $(-\infty, 3]$

End point/locator point: $(2, 3)$

End behavior: $\text{as } x \rightarrow \infty, f(x) \rightarrow -\infty$

$\text{as } x \rightarrow 2, f(x) \rightarrow 3$

Increasing interval: none

Decreasing interval: $(2, \infty)$

