

Identify the parent function, describe the transformations, state the domain and range, and describe the end behavior, then graph the function.

1. $f(x) = -(x+2)^3$

Parent Function: Cubic

Transformations: flipped $\leftarrow 2$

Domain: $(-\infty, \infty)$

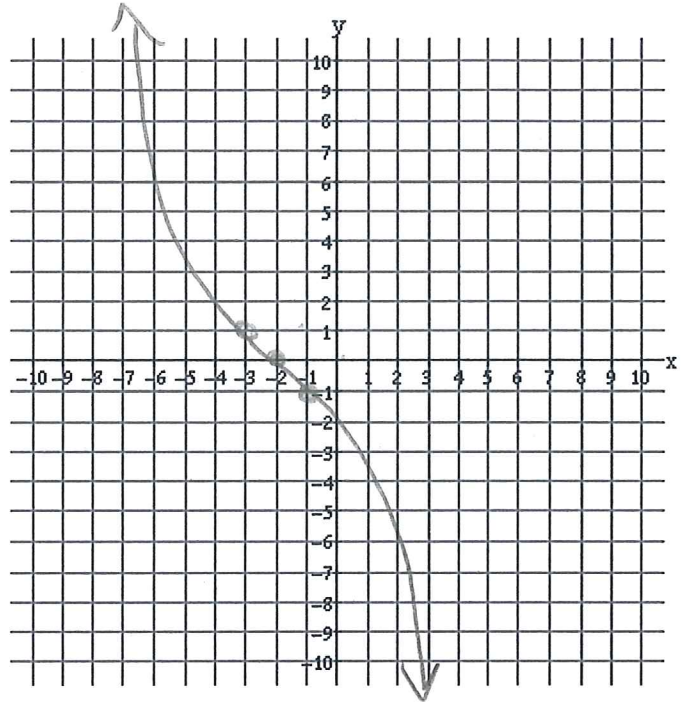
Range: $(-\infty, \infty)$

Relative Extrema: none

Increasing Interval(s): none

Decreasing Interval(s): $(-\infty, \infty)$

End Behavior: $x \rightarrow \infty$ $f(x) \rightarrow -\infty$
 $x \rightarrow -\infty$ $f(x) \rightarrow \infty$



2. $f(x) = |x+4| - 6$

Parent Function: Absolute Value

Transformations: $\leftarrow 4$ $\downarrow 6$

Domain: $(-\infty, \infty)$

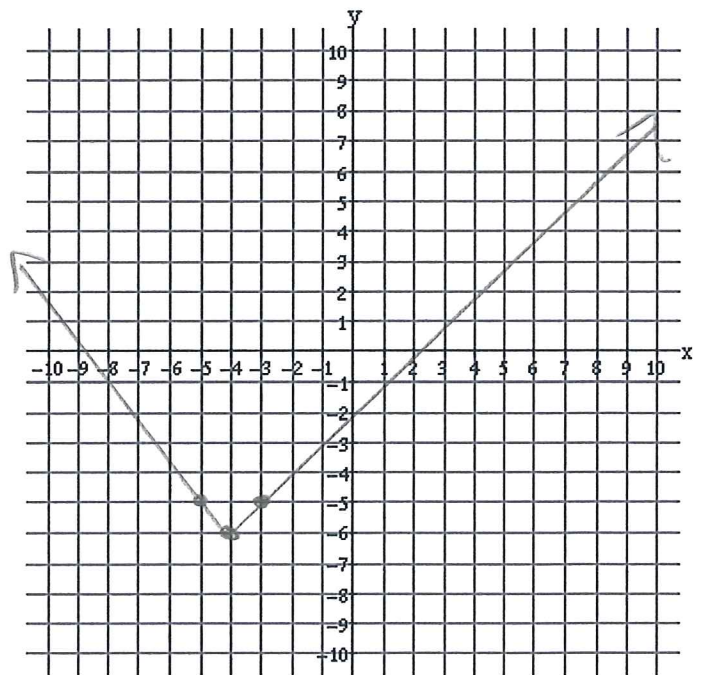
Range: $[-6, \infty)$

Relative Extrema: min: $(-4, -6)$

Increasing Interval(s): $(-4, \infty)$

Decreasing Interval(s): $(-\infty, -4)$

End Behavior: $x \rightarrow \infty$ $f(x) \rightarrow \infty$
 $x \rightarrow -\infty$ $f(x) \rightarrow \infty$



3. $f(x) = \frac{1}{2}(x-5)^3 + 2$

Parent Function: Cubic

Transformations: stretched by $\frac{1}{2}$

$\rightarrow 5$ $\uparrow 2$

Domain: $(-\infty, \infty)$

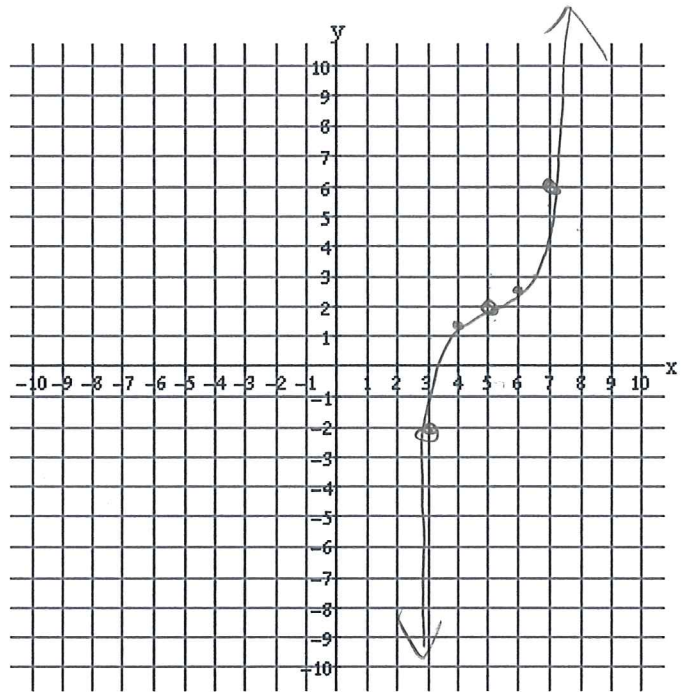
Range: $(-\infty, \infty)$

Relative Extrema: none

Increasing Interval(s): $(-\infty, \infty)$

Decreasing Interval(s): none

End Behavior: $x \rightarrow \infty \quad f(x) \rightarrow \infty$
 $x \rightarrow -\infty \quad f(x) \rightarrow -\infty$



4. $f(x) = -2(x-3)^2$

Parent Function: quadratic

Transformations: stretched by 2,

$\rightarrow 3$, flipped

Domain: $(-\infty, \infty)$

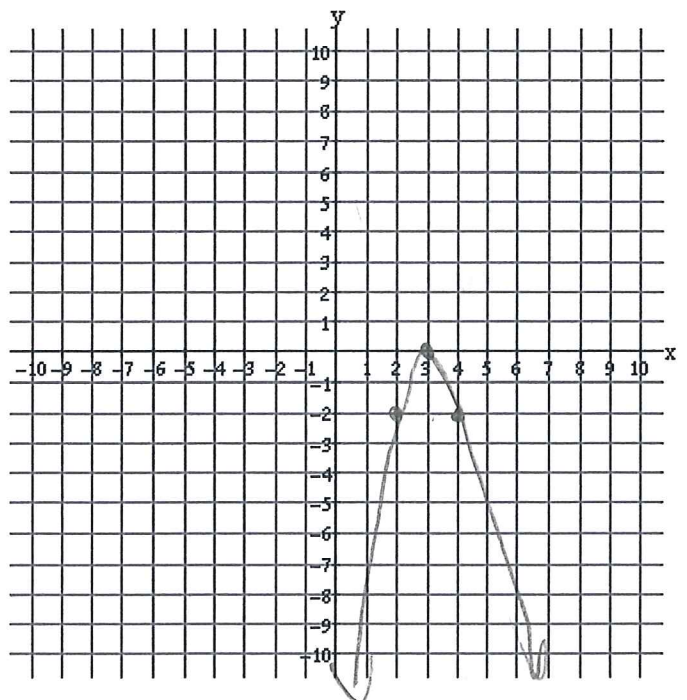
Range: $(-\infty, 0]$

Relative Extrema: max (0, 3)

Increasing Interval(s): $(-\infty, 3)$

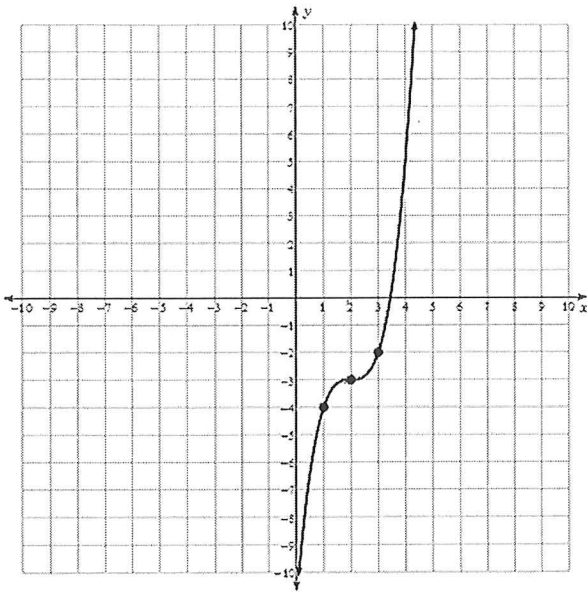
Decreasing Interval(s): $(3, \infty)$

End Behavior: $x \rightarrow \infty \quad f(x) \rightarrow -\infty$
 $x \rightarrow -\infty \quad f(x) \rightarrow -\infty$



Name the parent function of each graph and then write the equation.

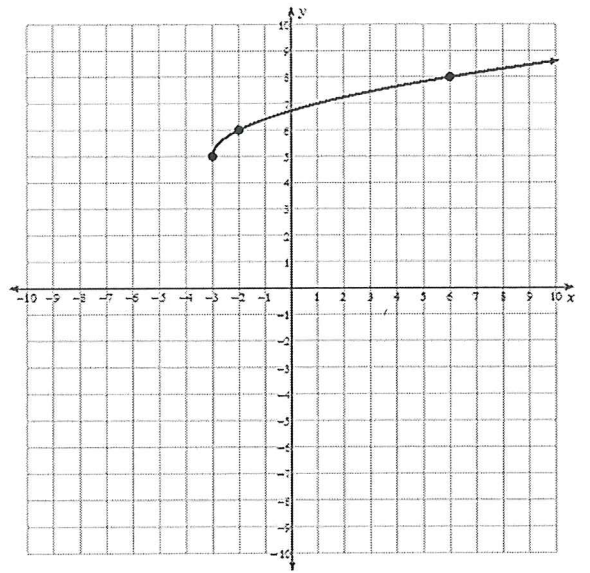
5.)



Parent Function: cubic

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

6.)



Parent Function: square root

$$g(x) = \underline{\sqrt{x+3} + 5}$$

Use the equation of the function to fill out the key information.

7.) $f(x) = \frac{1}{x-4} + 3$

Parent Function: rational

Transformations: →4 ↑3

Domain: $(-\infty, 4) \cup (4, \infty)$

Range: $(-\infty, 3) \cup (3, \infty)$

Relative Extrema: none

Increasing Interval(s): none

Decreasing Interval(s): $(-\infty, 4) \cup (4, \infty)$

End Behavior: $x \rightarrow \infty \quad f(x) \rightarrow \frac{3}{-4}$
 $x \rightarrow -\infty \quad f(x) \rightarrow \frac{3}{-4}$

8.) $\frac{-1}{x+1} - 4$

Parent Function: rational

Transformations: flipped ←1, ↓4

Domain: $(-\infty, -1) \cup (-1, \infty)$

Range: $(-\infty, -4) \cup (-4, \infty)$

Relative Extrema: none

Increasing Interval(s): $(-\infty, -1) \cup (-1, \infty)$

Decreasing Interval(s): none

End Behavior: $x \rightarrow \infty \quad f(x) \rightarrow \frac{-4}{-4}$
 $x \rightarrow -\infty \quad f(x) \rightarrow \frac{-4}{-4}$