

For #1-4, graph each function shown, and list all of the requested information.

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

Parent Function:  $f(x) = \sqrt{x}$

Transformations: right 3,  
down 2

Domain:  $[3, \infty)$

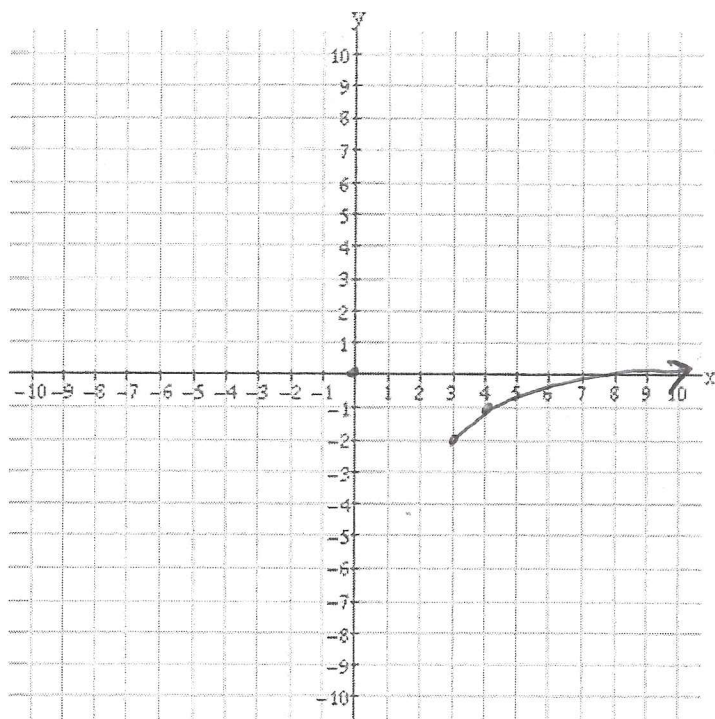
Range:  $[-2, \infty)$

Relative Extrema: none

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

Decreasing Interval(s): none

End Behavior:  $x \rightarrow \infty$   $f(x) \rightarrow \infty$   
 $x \rightarrow -\infty$   $f(x) \rightarrow$  none



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

Parent Function:  $f(x) = |x|$

Transformations: flipped,  
stretch  $\frac{1}{2}$ , left 5, down 3

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

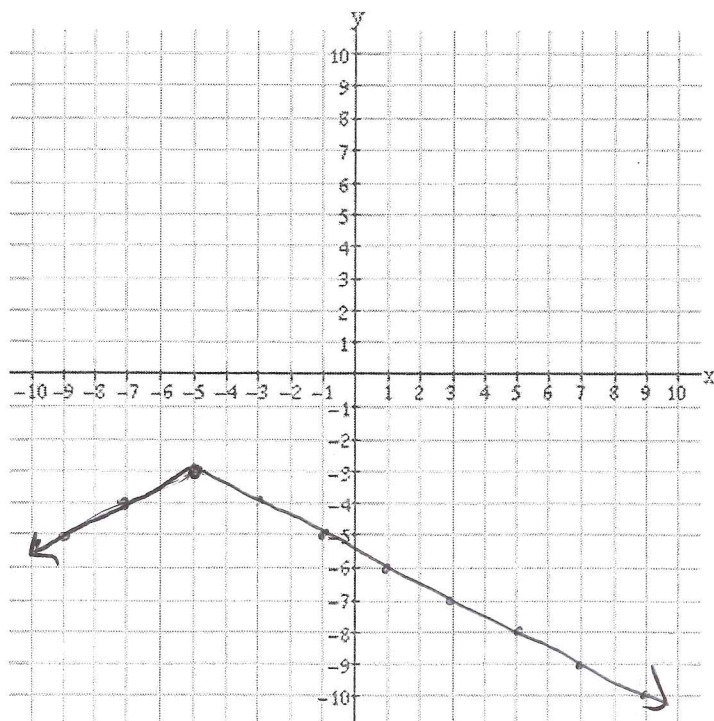
Range:  $(-\infty, -3]$

Relative Extrema: max  $(-5, -3)$

Increasing Interval(s):  $(-\infty, -5)$

Decreasing Interval(s):  $(-5, \infty)$

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



Use the following equations to list all of the requested information

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



Parent Function:  $f(x) = x^3$

Transformations: flipped, left 1, up 3

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

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

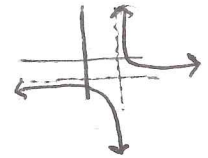
Relative Extrema: none

Increasing Interval(s): none

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

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

4.)  $f(x) = \frac{1}{x-3} - 2$



Parent Function:  $f(x) = \frac{1}{x}$

Transformations: right 3, down 2

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

Range:  $(-\infty, -2) \cup (-2, \infty)$

Relative Extrema: none

Increasing Interval(s): none

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

End Behavior:  $x \rightarrow \infty \quad f(x) \rightarrow -2$   
 $x \rightarrow -\infty \quad f(x) \rightarrow -2$

5.)  $f(x) = (x+4)^2$



Parent Function:  $f(x) = x^2$

Transformations: left 4

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

Range:  $[0, \infty)$

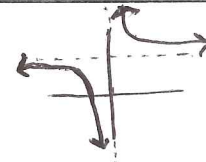
Relative Extrema: min (-4, 0)

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

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

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

6.)  $f(x) = \frac{1}{x} + 4$



Parent Function:  $f(x) = \frac{1}{x}$

Transformations: up 4

Domain:  $(-\infty, 0) \cup (0, \infty)$

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

Relative Extrema: none

Increasing Interval(s): none

Decreasing Interval(s):  $(-\infty, 0) \cup (0, \infty)$

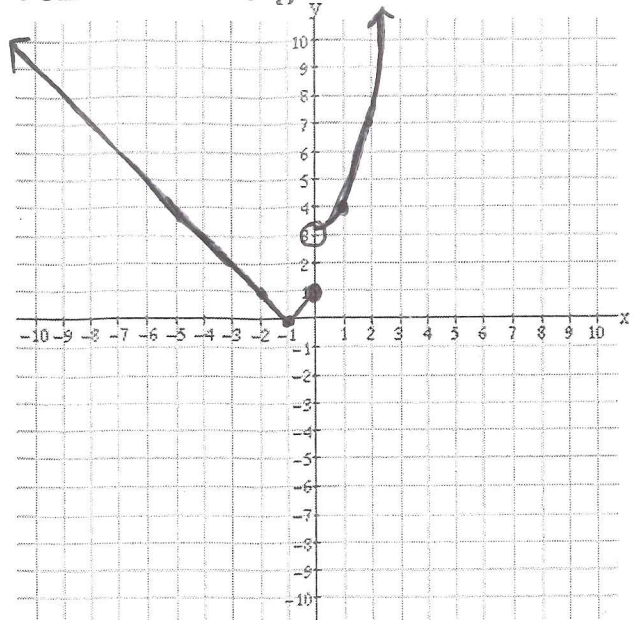
End Behavior:  $x \rightarrow \infty \quad f(x) \rightarrow 4$   
 $x \rightarrow -\infty \quad f(x) \rightarrow 4$

Graph the following piecewise function. State the domain and range.

$$7.) f(x) = \begin{cases} |x+1| & x \leq 0 \\ x^2+3 & x > 0 \end{cases}$$

x	f(x)
0	1
-1	0
-2	1

x	f(x)
0	3
1	4
2	7



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

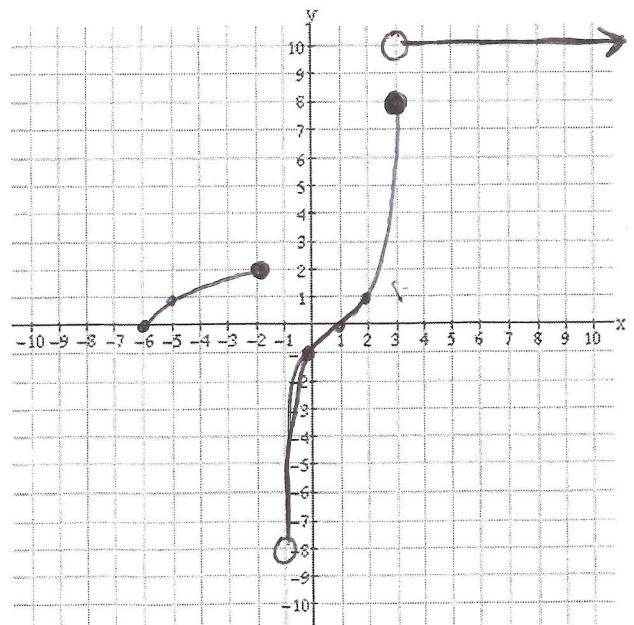
Range:  $[0, \infty)$

$$8.) g(x) = \begin{cases} \sqrt{x+6} & x \leq -2 \\ (x-1)^3 & -1 < x \leq 3 \\ 10 & x > 3 \end{cases}$$

x	f(x)
-2	2
-5	1
-6	0

x	f(x)
-1	-8
0	-1
1	0
2	1
3	8

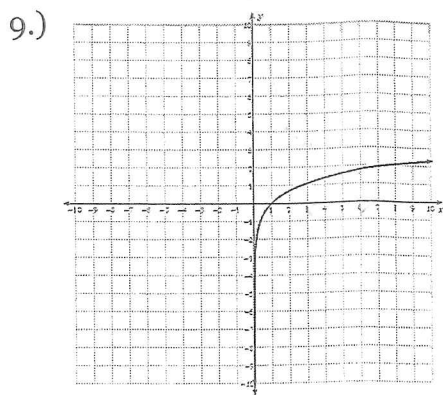
x	f(x)
3	10
4	10
⋮	⋮



Domain:  $[-6, -2] \cup (-1, \infty)$

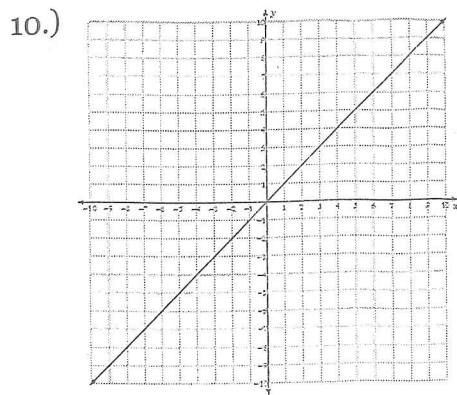
Range:  $(-8, 6] \cup [10, 10]$

Name and write the equation of each parent function.



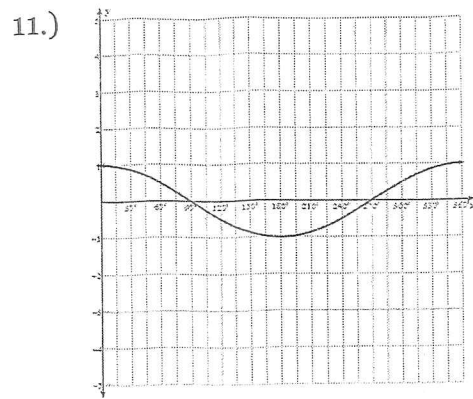
Name: Logarithmic

Equation:  $f(x) = \ln x$



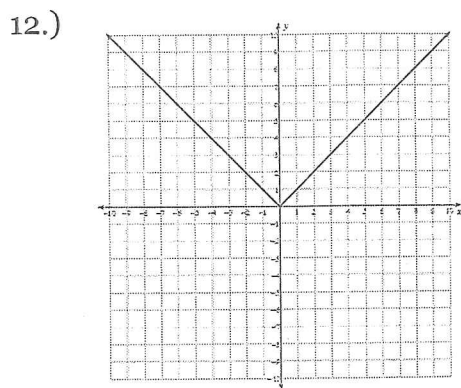
Name: linear

Equation:  $f(x) = x$



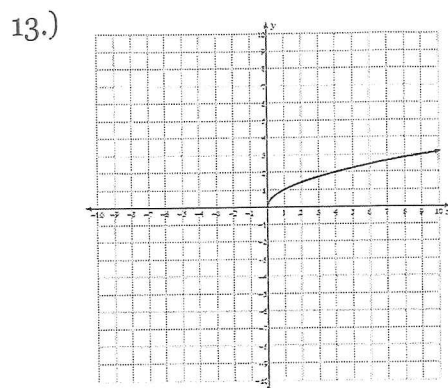
Name: cosine

Equation:  $f(x) = \cos x$



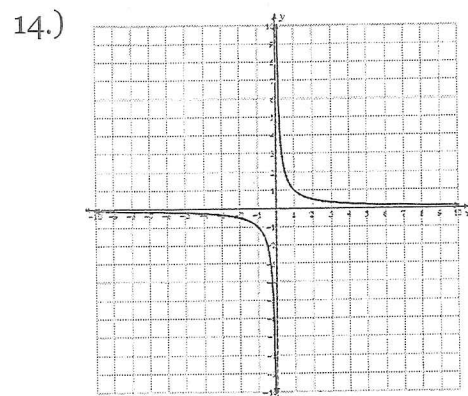
Name: absolute value

Equation:  $f(x) = |x|$



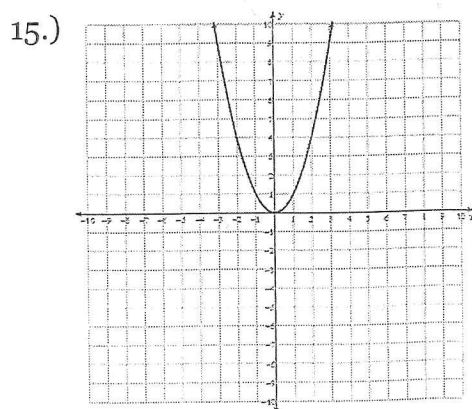
Name: square root

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



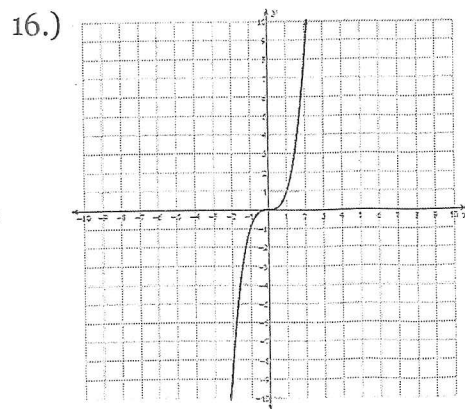
Name: rational

Equation:  $f(x) = \frac{1}{x}$



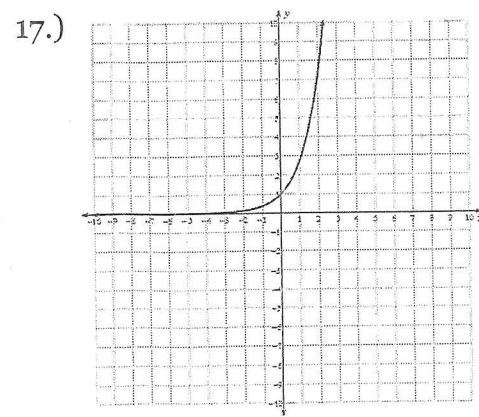
Name: Quadratic

Equation:  $f(x) = x^2$



Name: Cubic

Equation:  $f(x) = x^3$



Name: exponential

Equation:  $f(x) = e^x$