

Warm Up

Identify the domain and range:

1) $f(x) = -x^3 + 6$

Domain: \mathbb{R}

Range: \mathbb{R}

2) $f(x) = \sqrt{x - 3} + 8$

Domain: $x \geq 3$

Range: $y \geq 8$

3) $f(x) = |x + 7| - 2$

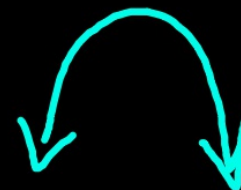
Domain: \mathbb{R}

Range: $y \geq -2$

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

Domain: \mathbb{R}

Range: $y \leq 0$



Now re-write each in interval notation:

1) $f(x) = -x^3 + 6$
Domain: \mathbb{R} $(-\infty, \infty)$

Range: \mathbb{R}

2) $f(x) = \sqrt{x - 3} + 8$
Domain: $x \geq 3$ $[3, \infty)$

Range: $y \geq 8$ $[8, \infty)$

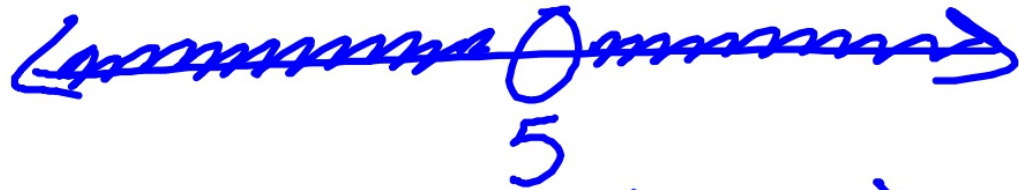
3) $f(x) = |x + 7| - 2$
Domain: \mathbb{R}

Range: $y \geq -2$
 $[-2, \infty)$

4) $f(x) = -(x + 5)^2$
Domain: \mathbb{R}

Range: $y \leq 0$
 $(-\infty, 0]$

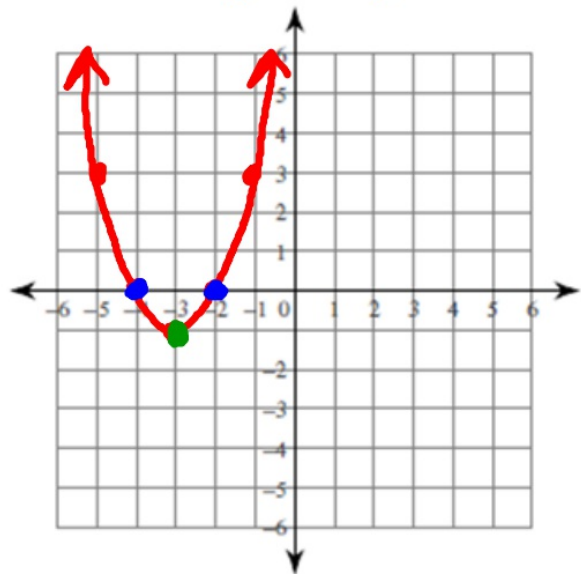
$$x \neq 5$$



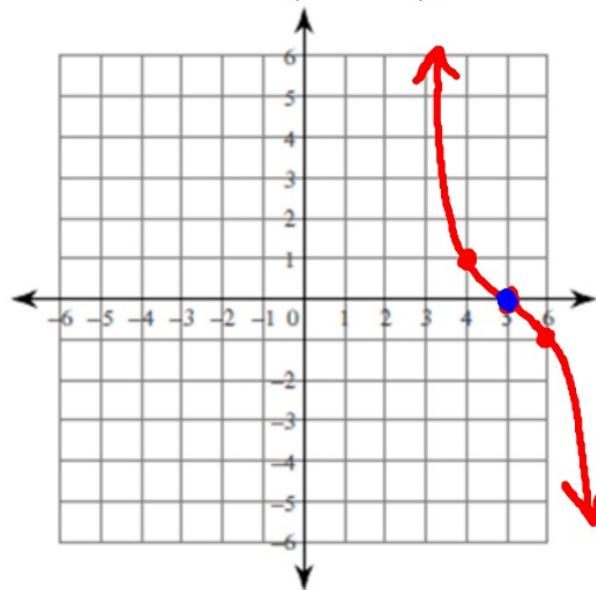
$$(-\infty, 5) \cup (5, \infty)$$

Identify the parent function, the transformations and graph each equation:

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



2) $f(x) = -(x - 5)^3$



Domain: \mathbb{R}

Range: $y \geq -1$

Positive: $(-\infty, -4) \cup (-2, \infty)$
Cross x-axis

Increasing: $(-3, \infty)$

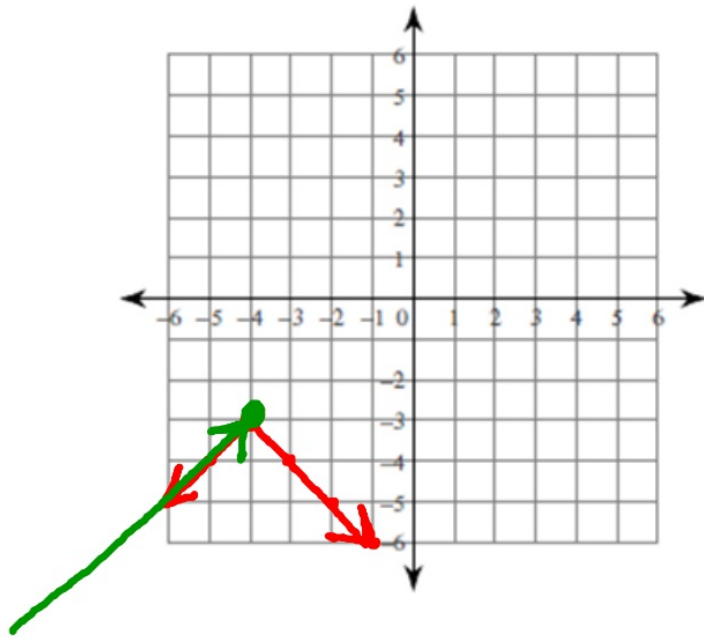
Domain: \mathbb{R}

Range: \mathbb{R}

Positive: $(-\infty, 5)$

Increasing: \emptyset

3) $f(x) = -|x + 4| - 3$



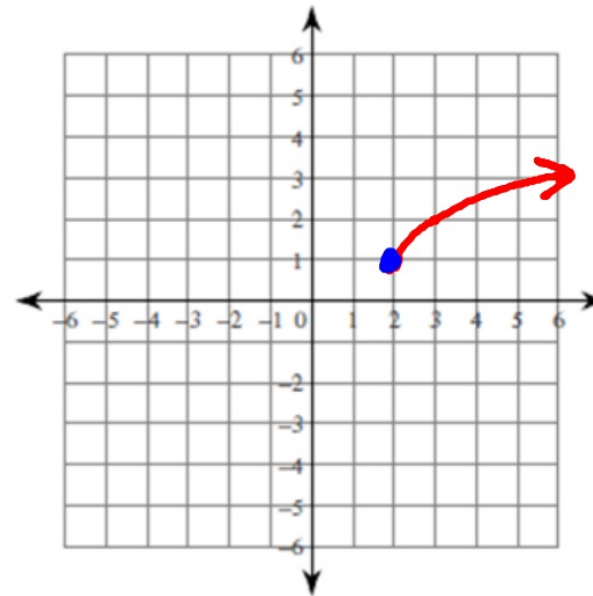
Domain: \mathbb{R}

Range: $y \leq -3$

Positive: \emptyset

Increasing: $(-\infty, -4]$

4) $f(x) = \sqrt{x - 2} + 1$



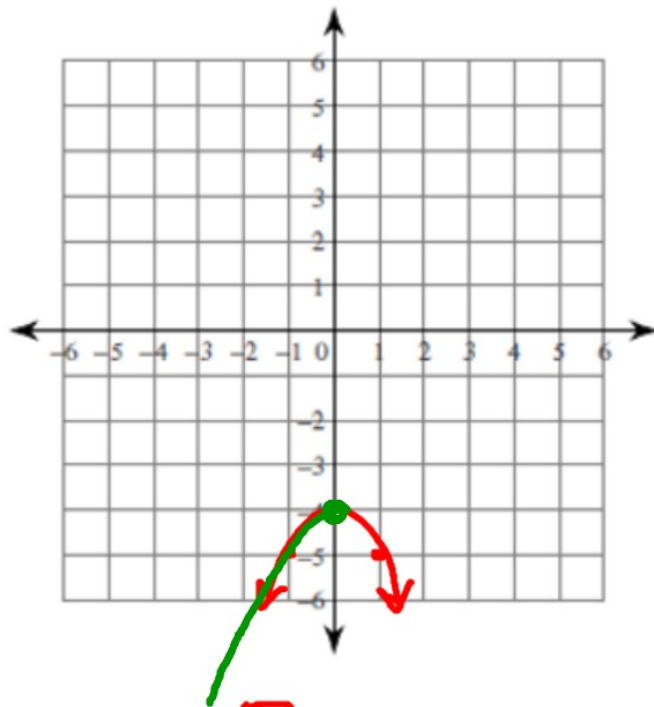
Domain: $x \geq 2$

Range: $y \geq 1$

Positive: $[2, \infty)$

Increasing: $[2, \infty)$

5) $f(x) = -x^2 - 4$



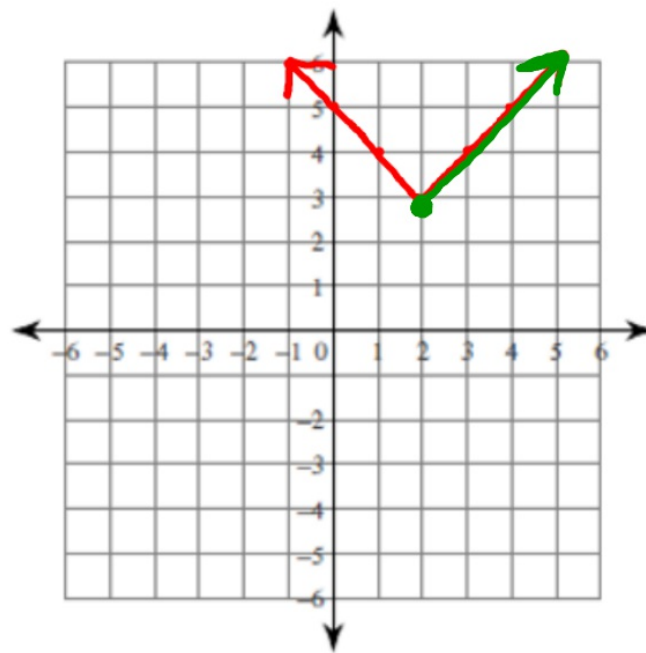
Domain: \mathbb{R}

Range: $y \leq -4$

Positive: \emptyset

Increasing: $(-\infty, 0)$

6) $f(x) = |x - 2| + 3$



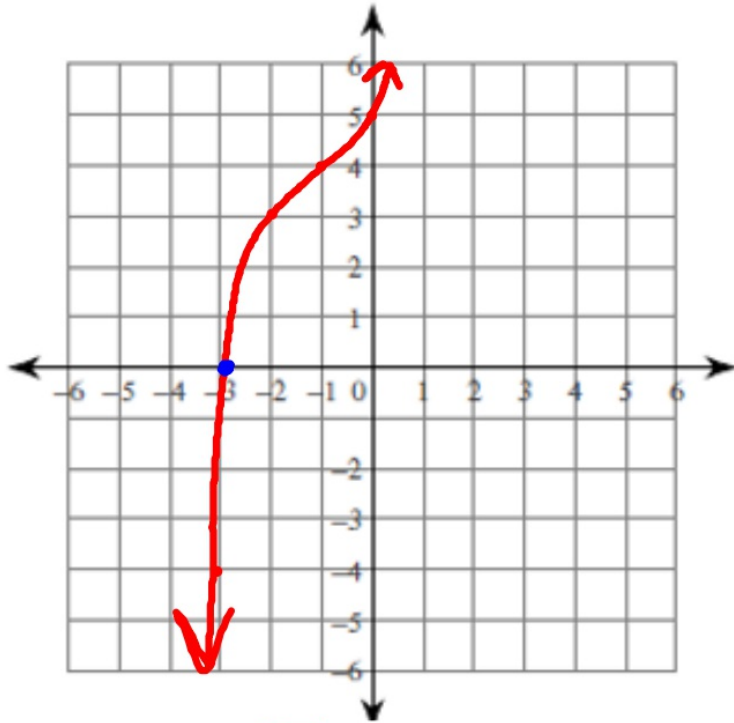
Domain: \mathbb{R}

Range: $y \geq 3$

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

Increasing: $[2, \infty)$

7) $f(x) = (x + 1)^3 + 4$



Domain: \mathbb{R}

Range: \mathbb{R}

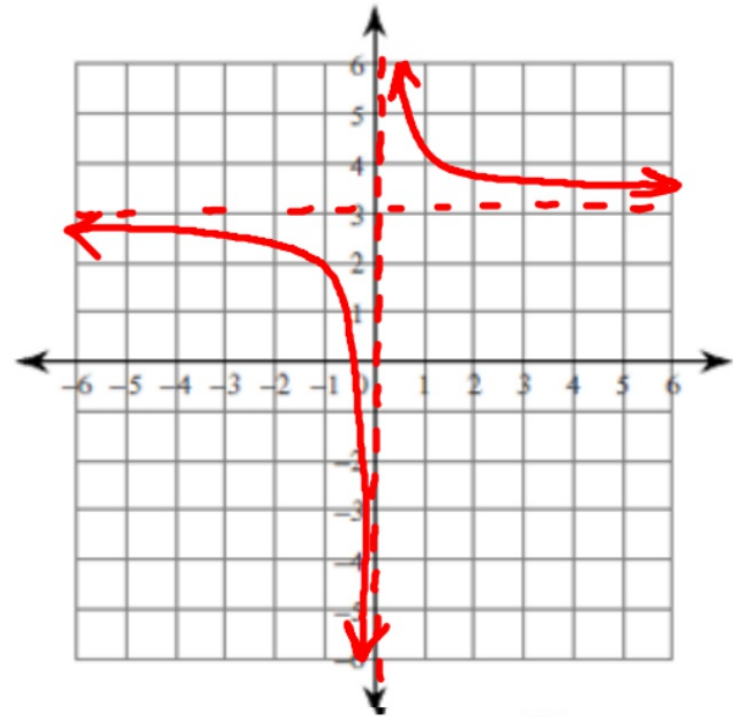
Positive:

$(-2.9, \infty)$

Increasing:

$(-\infty, \infty)$

8) $f(x) = \frac{1}{x} + 3$



Domain: $x \neq 0$

Range: $y \neq 3$

Unit 5: Functions Part I

Parent Functions

Type

Transformations

Interval Notation

Domain

Range

$$f(x) = -|x + 1| + 3$$

Type: *Abs. Value*

Transformation(s):

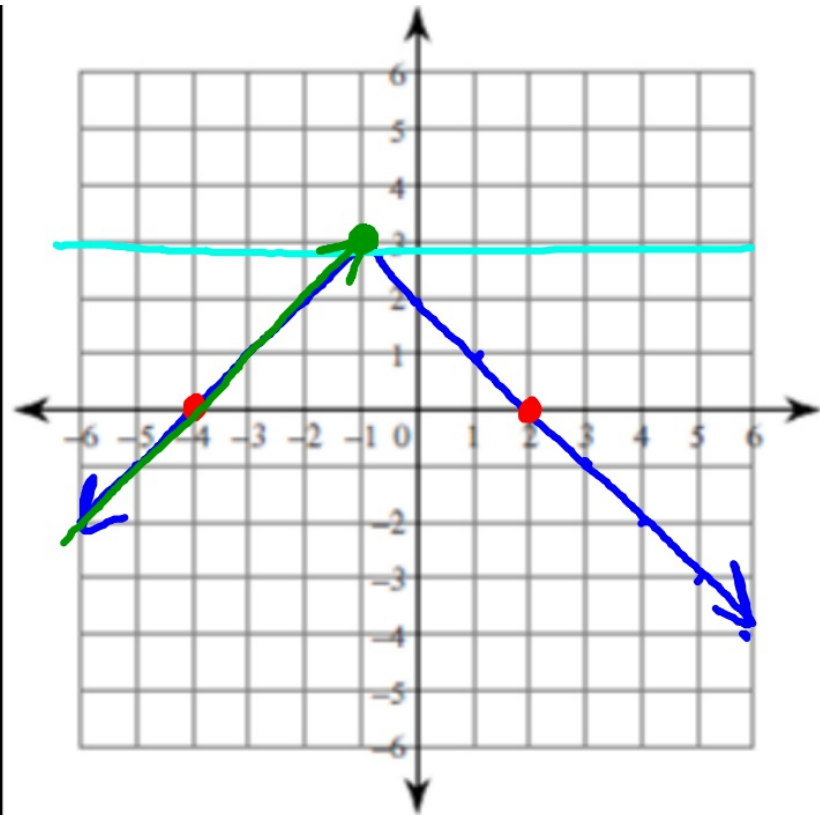
Ref, Left 1, Up 3

Domain: \mathbb{R} *$(-\infty, \infty)$*

Range: $y \leq 3$ *$(-\infty, 3]$*

Positive Interval(s): *$(-4, 2)$*
Cross x-axis

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



Type: Sq. Root

Transformation(s):

Left 2
Down 2

Domain:

$x \geq -2$ $[-2, \infty)$

Range:

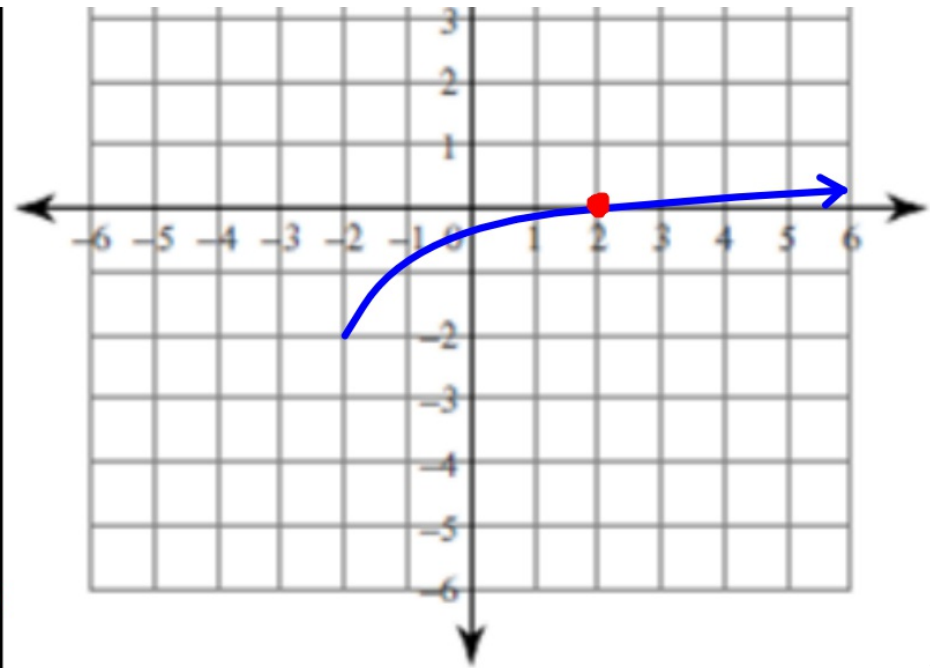
$y \geq -2$ $[-2, \infty)$

Positive Interval(s):

$(2, \infty)$

Increasing Interval(s):

$[-2, \infty)$



Equation:

$$y = \sqrt{x+2} - 2$$

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

Type: *Cubic*

Transformation(s):

Left 2, Up 1

Domain:

\mathbb{R}

Range:

\mathbb{R}

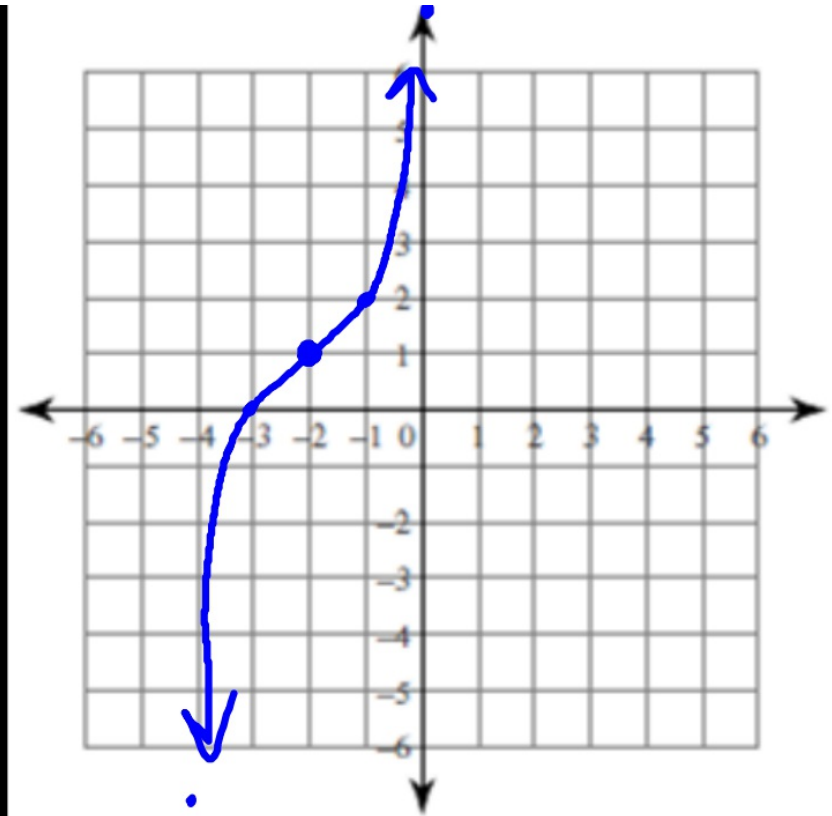
$(-\infty, \infty)$

Positive Interval(s):

$(-3, \infty)$

Increasing Interval(s):

$(-\infty, \infty)$



Type: Quadratic

Transformation(s):

Right 3

Down 4

Domain:

\mathbb{R}

Range:

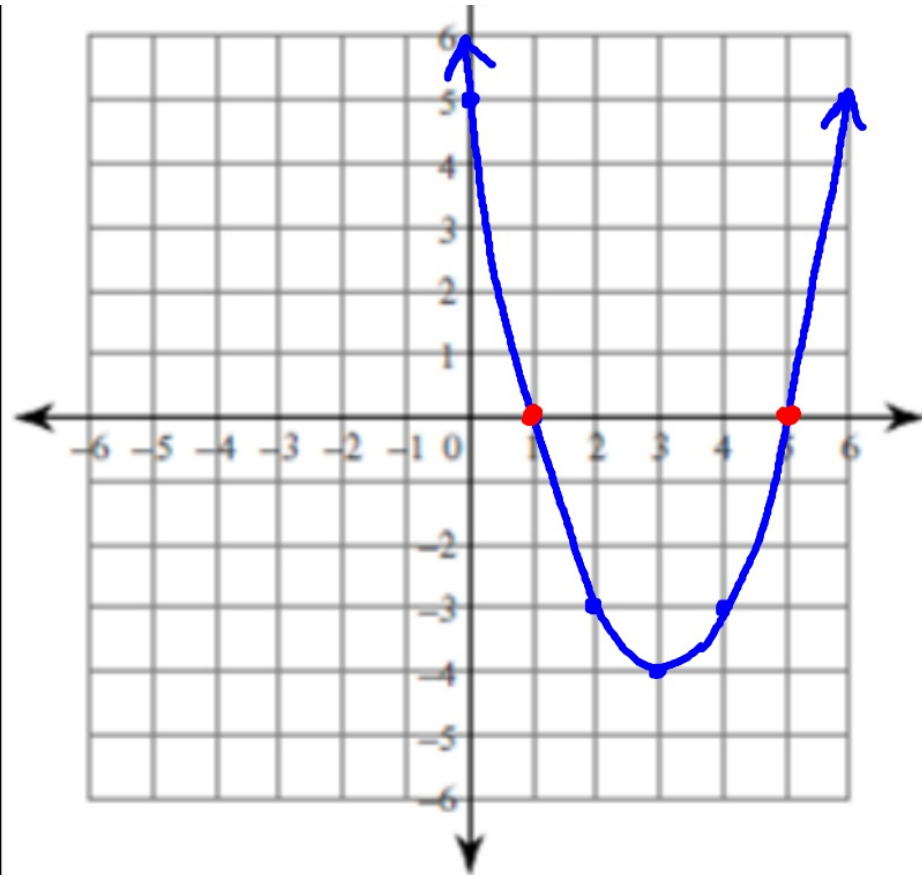
$y \geq -4$ $[-4, \infty)$

Positive Interval(s):

$(-\infty, 1) \cup (5, \infty)$

Increasing Interval(s):

$(3, \infty)$



Equation:

$$y = (x-3)^2 - 4$$