

1. Indicate whether the set defines a function. If it does, state the domain and range of the function.

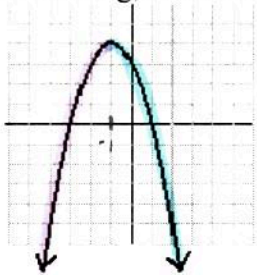
$$\{(3, 9), (4, 9), (5, 9), (6, 9)\}$$

Function - No Repeated x-values

2. Find the value of $f(-1)$ if $f(x) = -5x^2 - 3x$.

$$\begin{aligned} f(-1) &= -5(-1)^2 - 3(-1) \\ &= -5 + 3 = -2 \end{aligned}$$

3. Find the intervals over which f is increasing, decreasing, and constant.



Incr: $(-\infty, -1)$

Decr: $(-1, \infty)$

Const: none

5. Find the domain. Write your answer in interval notation.

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

$$2x - 8 \geq 0$$

$$2x \geq 8$$

$$x \geq 4$$

$$D: [4, \infty)$$

4. Find the x- and y-intercepts.

$$f(x) = \frac{x^2 - 81}{x + 3}$$

$$\begin{aligned} \text{x-int: } 0 &= x^2 - 81 \\ 81 &= x^2 \\ \pm 9 &= x \end{aligned}$$

$$\begin{aligned} \text{y-int: } y &= \frac{0^2 - 81}{0 + 3} \\ y &= \frac{-81}{3} \\ y &= -27 \end{aligned}$$

6. Find the domain. Write your answer in interval notation.

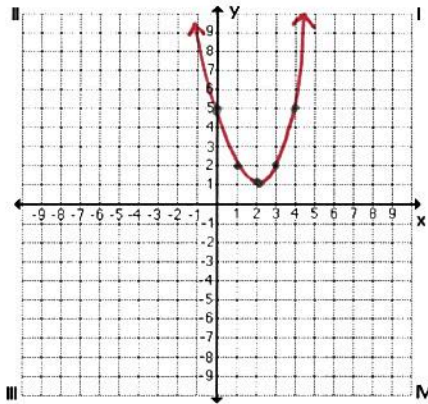
$$f(x) = \frac{1}{x+2}$$

$$x + 2 \neq 0$$

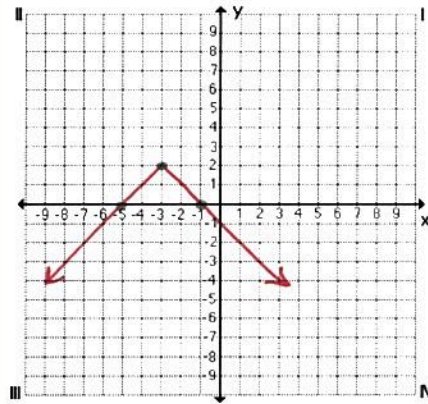
$$x \neq -2$$

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

RIGHT UP
 $\downarrow \quad \downarrow$
 7. Graph $y = (x-2)^2 + 1$



Flip Left UP
 $\downarrow \quad \downarrow \quad \downarrow$
 8. Graph $y = -|x+3| + 2$



9.

10. $f(x) = 2x^2 - 12x + 14$

a. Find the coordinates of the vertex. Is it a maximum or minimum? ↻

$$x = \frac{-b}{2a} = \frac{+12}{2(2)} = \frac{12}{4} = 3$$

b/c "a" is pos

$$f(x) = 2(3)^2 - 12(3) + 14$$

$$= 2(9) - 36 + 14 = -4$$

V: (3, -4)

b. Find the equation of the axis of symmetry.

$$x = 3$$

c. Find the domain and range.

D: $(-\infty, \infty)$ R: $[-4, \infty)$

d. Find the x- and y-intercepts.

x-int: $0 = 2x^2 - 12x + 14$

$$0 = x^2 - 6x + 7$$

$$9 + 7 = x^2 - 6x + 9 \quad \left(\frac{6}{2}\right)^2 = 9$$

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

$$\pm\sqrt{2} = x - 3$$

$$3 \pm \sqrt{2} = x$$

$$3 + \sqrt{2} \approx 4.4$$

$$3 - \sqrt{2} \approx 1.6$$

y-int: $y = 2(0)^2 - 12(0) + 14$
 $y = 14$

e. Sketch the graph

