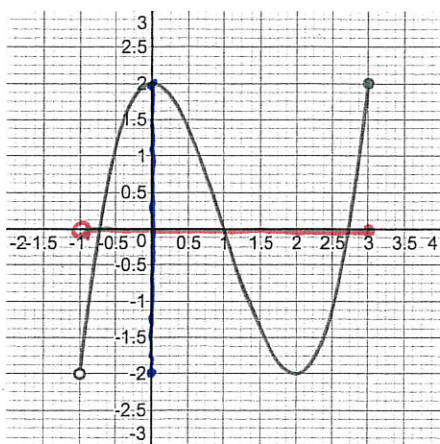


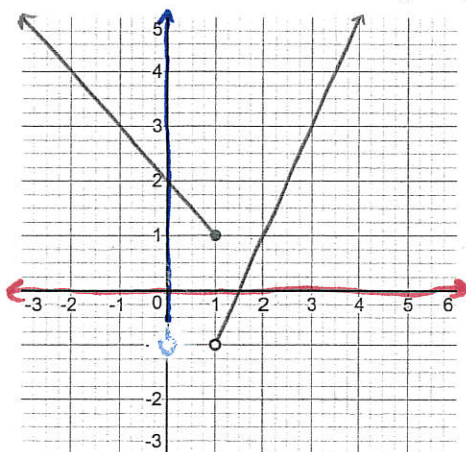
§P.6: Graphs of Functions

- 1.] Use the graph of $y = f(x)$ below to determine the domain and range, intervals of increasing/decreasing, and find the function values using the graph.



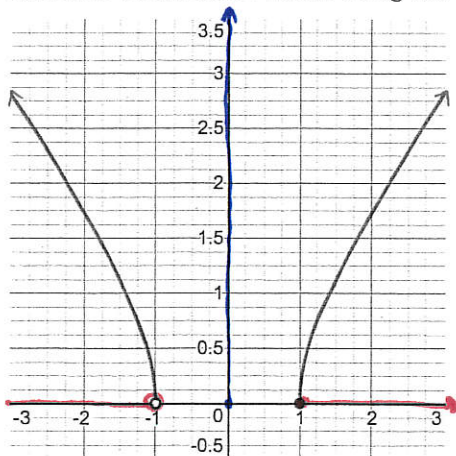
- a.) Domain: $(-1, 3]$
- b.) Range: $[-2, 2]$
- c.) Increasing on: $(-1, 0) \cup (2, 3)$
- d.) Decreasing on: $(0, 2)$
- e.) $f(-1) = \text{DNE}$
- f.) $f(1) = 0$
- g.) $f(3) = 2$

- 2.] Use the graph of $y = f(x)$ below to determine the domain and range, intervals of increasing/decreasing, and find the function values using the graph.



- a.) Domain: $(-\infty, \infty)$
- b.) Range: $(-1, \infty)$
- c.) Increasing on: $(1, \infty)$
- d.) Decreasing on: $(-\infty, 1)$
- e.) $f(2) < 1$
- f.) $f(1) = 1$
- g.) $f(3) = 3$

- 3.] Use the graph of $y = f(x)$ below to determine the domain and range, intervals of increasing/decreasing, and find the function values using the graph.



- a.) Domain: $(-\infty, -1) \cup [1, \infty)$
- b.) Range: $[0, \infty)$
- c.) Increasing on: $(1, \infty)$
- d.) Decreasing on: $(-\infty, -1)$
- e.) $f(-1) = \text{DNE}$
- f.) $f(0) = \text{DNE}$
- g.) $f(1) = 0$

- 4.] Find the zeros of the function $f(x) = 2x^2 - 7x - 30$

$$2x^2 - 7x - 30 = 0$$

$$\Rightarrow (2x+5)(x-6) = 0$$

$$\Rightarrow 2x+5=0 \quad x-6=0$$

$$\Rightarrow 2x = -5 \quad x = 6$$

$$\Rightarrow \boxed{x = -\frac{5}{2}} \quad \boxed{x = 6}$$

- 5.] Find the zeros of the function $f(x) = \sqrt{2x+11}$

$$\sqrt{2x+11} = 0$$

$$\Rightarrow (\sqrt{2x+11})^2 = 0^2$$

$$\Rightarrow 2x+11=0$$

$$\Rightarrow 2x = -11$$

$$\Rightarrow \boxed{x = -\frac{11}{2}}$$

- 6.] Find the zeros of the function $f(x) = \frac{2x^2 - 9}{3 - x}$

$$\frac{2x^2 - 9}{3 - x} = 0$$

$$\Rightarrow \frac{2x^2 - 9}{3 - x} \cdot (3 - x) = 0 \cdot (3 - x)$$

$$\Rightarrow 2x^2 - 9 = 0$$

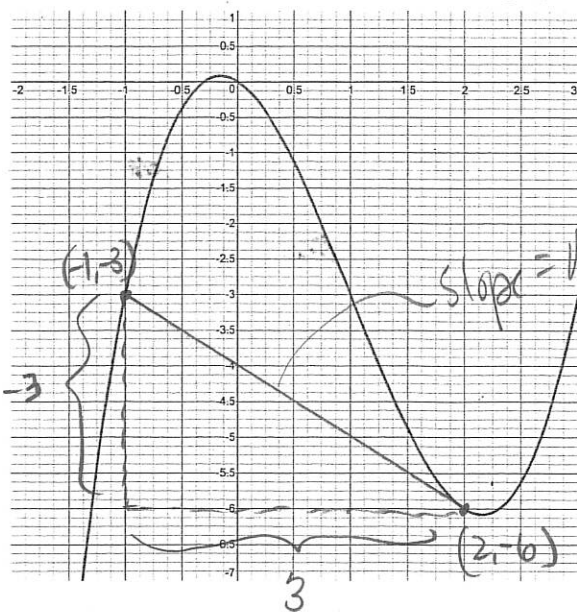
$$\Rightarrow 2x^2 = 9$$

$$\Rightarrow x^2 = \frac{9}{2}$$

$$\Rightarrow x = \pm \sqrt{\frac{9}{2}}$$

$$\Rightarrow \boxed{x = \frac{3}{\sqrt{2}}, x = -\frac{3}{\sqrt{2}}}$$

- 7.] The function $f(x) = x^3 - 3x^2 - x$ is graphed below. Find the average rate of change of f between $x_1 = -1$ and $x_2 = 2$. Sketch the secant line on the graph.



$$(\text{Avg Rate}) = \frac{f(x_2) - f(x_1)}{x_2 - x_1}$$

$$= \frac{-6 - (-3)}{2 - (-1)}$$

$$= \frac{-6 + 3}{3}$$

$$= \frac{-3}{3}$$

$$= \boxed{-1}$$

$$f(x_2) = f(2)$$

$$= 2^3 - 3(2)^2 - 2$$

$$= 8 - 12 - 2$$

$$= -6$$

$$f(x_1) = f(-1)$$

$$= (-1)^3 - 3(-1)^2 - (-1)$$

$$= -1 - 3 + 1$$

$$= -3$$