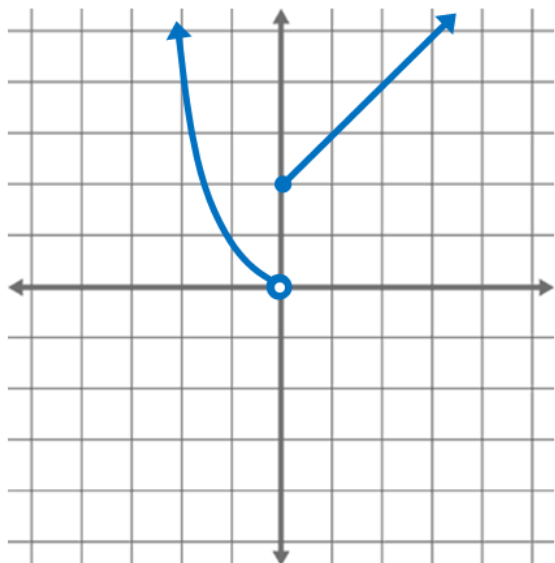


Assignment 1C: Piecewise Functions

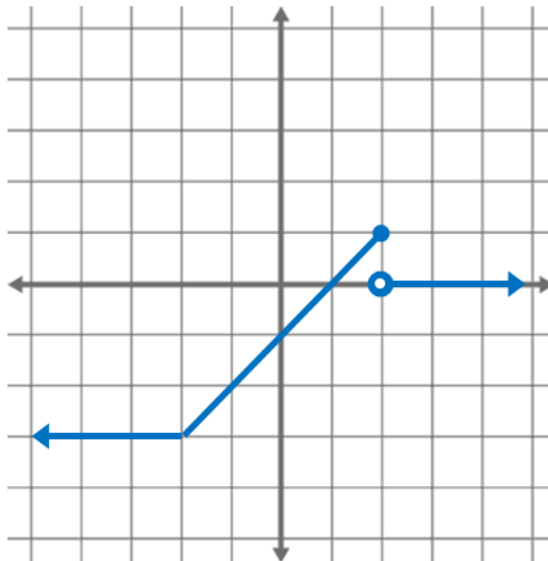
Answer the following problems with as much detail, explanation, and work that is appropriate.

Sketch a graph of each piecewise function. Label your axes clearly.

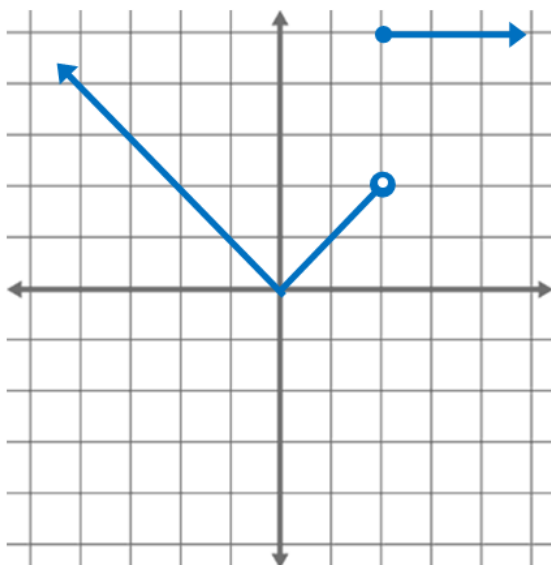
$$1. f(x) = \begin{cases} x^2 & \text{if } x < 0 \\ x+2 & \text{if } x \geq 0 \end{cases}$$



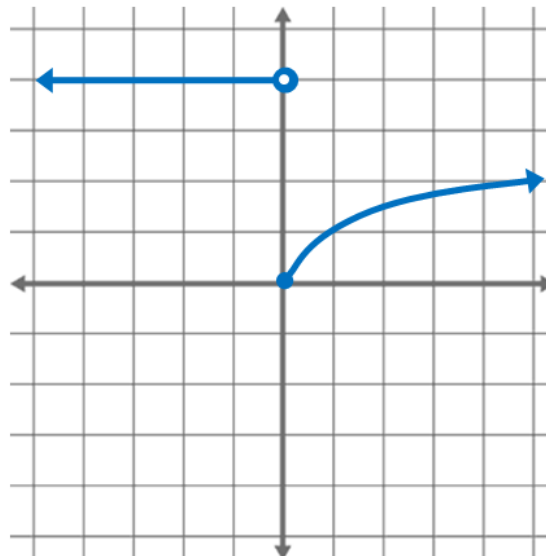
$$2. f(x) = \begin{cases} -3 & \text{if } x \leq -2 \\ x-1 & \text{if } -2 < x \leq 2 \\ 0 & \text{if } x > 2 \end{cases}$$



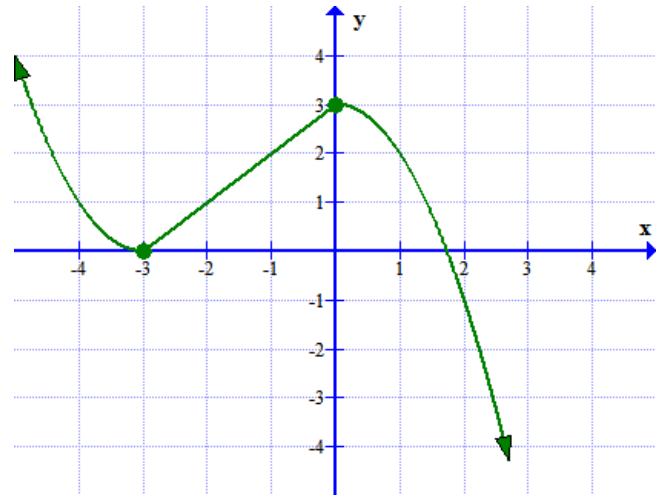
$$3. f(x) = \begin{cases} |x| & \text{if } x < 2 \\ 5 & \text{if } x \geq 2 \end{cases}$$



$$4. f(x) = \begin{cases} 4 & \text{if } x < 0 \\ \sqrt{x} & \text{if } x \geq 0 \end{cases}$$



$$5. f(x) = \begin{cases} (x+3)^2 & \text{if } x \leq -3 \\ x+3 & \text{if } -3 < x \leq 0 \\ -x^2+3 & \text{if } x > 0 \end{cases}$$



For the piece-wise function below, evaluate the given values. Justify with work.

$$6. f(x) = \begin{cases} 2x - 4 & \text{if } x \leq -5 \\ x^2 - 2 & \text{if } -5 < x \leq 3 \\ -2x^2 + 5 & \text{if } x > 3 \end{cases}$$

a) $f(-8) = 2(-8) - 4 = -20$

b) $f(-5) = 2(-5) - 4 = -14$

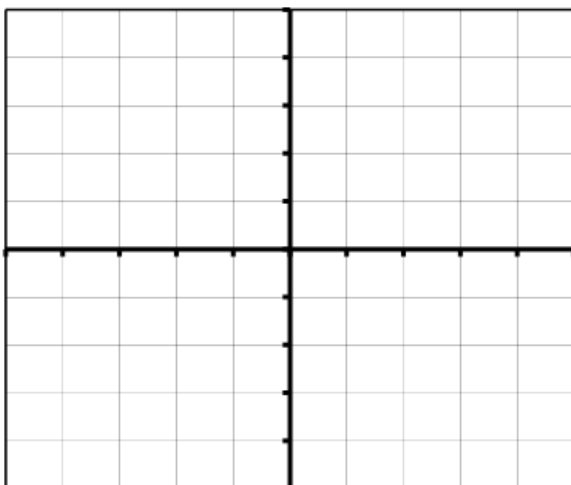
c) $f(0) = (0)^2 - 2 = -2$

d) $f(3) = (3)^2 - 2 = 7$

e) $f(4) = -2(4)^2 + 5 = -27$

7. Draw a linear piecewise function that is continuous (no breaks) and graph it. Then write the equations in function notation to match.

(Note: a “linear” piecewise function means that all the pieces are lines.)



$$f(x) = \left\{ \begin{array}{l} \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \end{array} \right.$$