1.4 Answer Key

Practice 4-1-1:

Evaluate the piecewise function. If there is no answer, please enter "N/A."

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

$f(0)$=2

$f(\mathbf{0})$ means finding the y-value when x =0. Based on the given function, we will use the second piece of the function $f(x) = x + 2 \quad if \quad x \geq 0$ (since 0=0).

Substitute 0 for x.

$f(x) = x + 2$

$f(0) = (0) + 2$

$f(0) = \mathbf{2}$

$f(-1)$= 1

$f(-\mathbf{1})$ means finding the y-value when x =-1. Based on the given function, we will use the first piece of the function $f(x) = x^2 \quad if \quad x < 0$ (since -1<0).

Substitute -1 for x

$f(x) = x^2$

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

$f(-1) = \mathbf{1}$

$f(2)$= 4

$f(\mathbf{2})$ means finding the y-value when x =2. Based on the given function, we will use the second piece of the function $f(x) = x + 2 \quad if \quad x \geq 0$ (since 2>0).

Substitute 2 for x.

$f(x) = x + 2$

$f(2) = (2) + 2$

$f(2) = \mathbf{4}$

$\boldsymbol{f(-3)}$**=9**

$f(-3)$ means finding the y-value when x =-3. Based on the given function, we will use the first piece of the function $f(x) = x^2 \quad if \quad x < 0$ (since -3<0).

Substitute -1 for x

$f(x) = x^2$

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

$f(-3) = \mathbf{9}$

Practice 4-3-2:

Evaluate the piecewise function. If there is no answer, please enter "N/A."

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

$\boldsymbol{f(0)}$**=-2**

$f(\mathbf{0})$ means finding the y-value when x =0. Based on the given function, we will use the first piece of the function $f(x) = x^2 - 2 \quad if \quad x < 1$ (since 0<1).

Substitute 0 for x

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

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

$f(0) = \mathbf{-2}$

$\boldsymbol{f(1)}$**= N/A**

$f(\mathbf{1})$ means finding the y-value when x =1. Based on the given function, we do not have any function includes x =1, thus $\boldsymbol{f(1)}$ **is undefined.**

$\boldsymbol{f(-1)}$**=**

$f(-\mathbf{1})$ means finding the y-value when x =-1. Based on the given function, we will use the first piece of the function $f(x) = x^2 - 2 \quad if \quad x < 1$ (since -1<1).

Substitute -1 for x

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

$f(0) = (-1)^2$-2

$f(0) = \mathbf{1 - 2}$

$f(0) = -\mathbf{1}$

Practice 4-4-1:

Graphing a Piecewise Function. Sketch a graph of the function.

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

Answer: a

Explanation: Based on the given functions, when using $2x - 1$, we must have an open circle at x =1. When using $1 + x$, we must have a closed dot at $x = 1$.
This is because piecewise functions define different rules over different parts of the domain. If $2x - 1$ is valid for x <1, it will have an open circle at x=1 (not included). If $1 + x$ is valid for $x \geq 1$, it will have a closed dot at $x = 1$ (included).