Worksheet Piecewise Functions Name:_____

Part I. Carefully graph each of the following. Graph the functions and answer the following questions.

1. $f(x) = \begin{cases} x+5 & x < -2 \\ x^2+2x+3 & x \geq -2 \end{cases}$

$f(3) =$

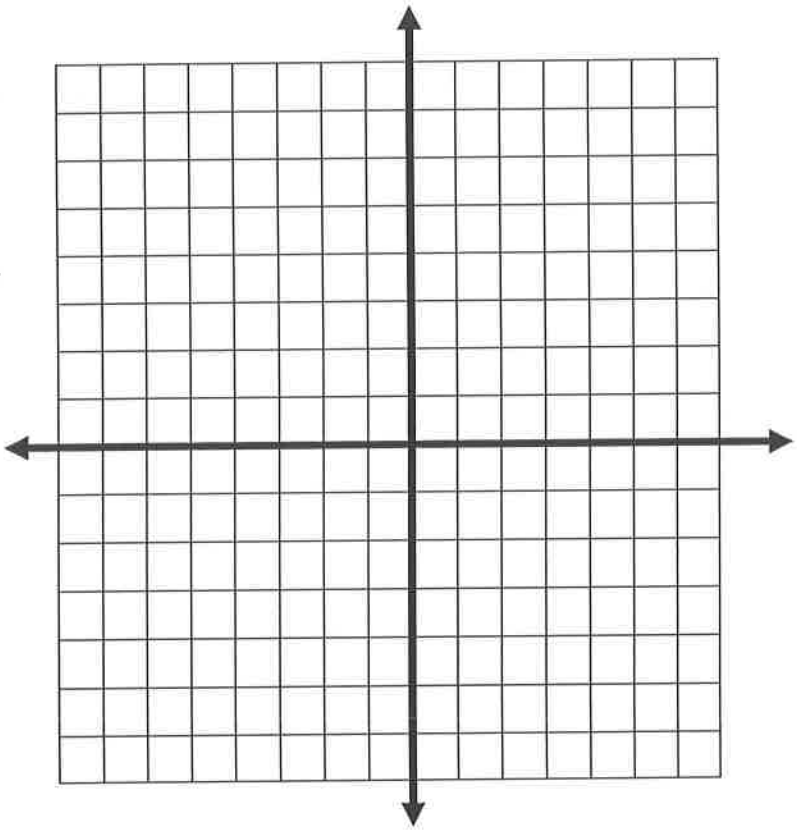
$f(-4) =$

$f(-2) =$

$\lim_{x \to -2^-} f(x) =$

$\lim_{x \to -2^+} f(x) =$

$\lim_{x \to -2} f(x) =$



State where the function is Continuous.

_____

State where the function is Discontinues.

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State any holes or asymptotes.

2. $f(x) = \begin{cases} 2x+1 & x \geq 1 \\ x^2+3 & x < 1 \end{cases}$

State where the function is Continuous.

_____

State where the function is Discontinues.

_____

State any holes or asymptotes.

$f(-2) =$

$f(6) =$

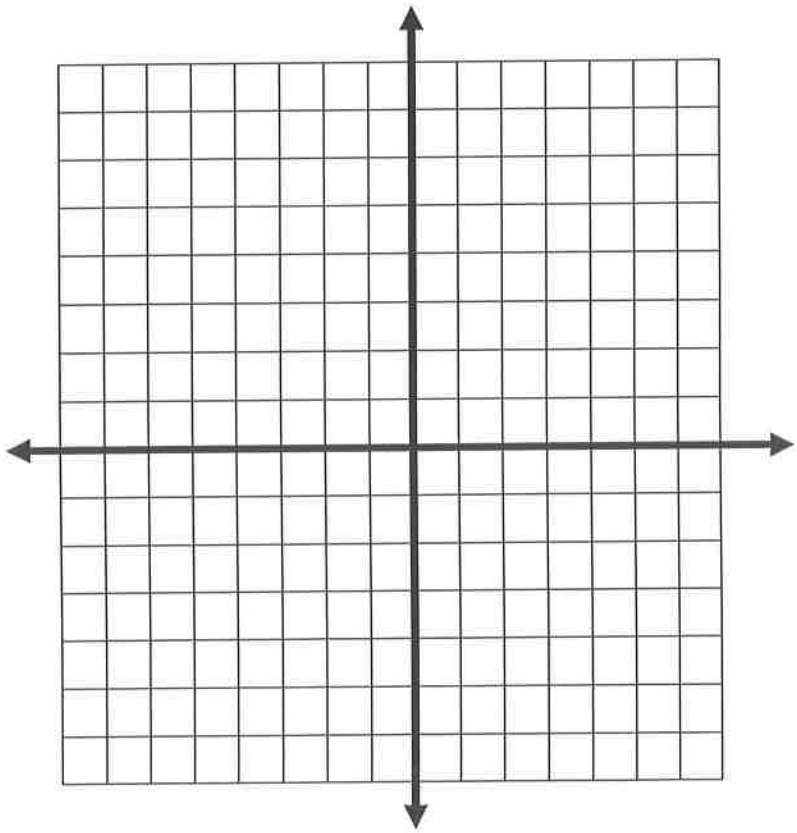
$f(1) =$

$\lim_{x \to 1^-} f(x) =$

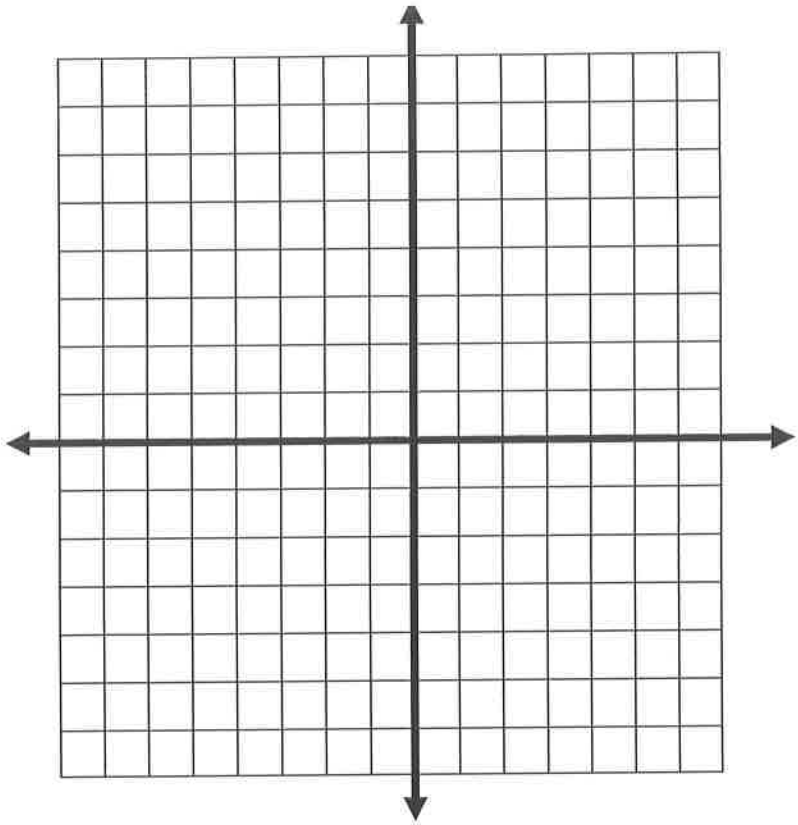
$\lim_{x \to 1^+} f(x) =$

$\lim_{x \to 1} f(x) =$

$\lim_{x \to -2} f(x) =$



3. $f(x) = \begin{cases} -2x+1 & x \le 2 \\ 5x-4 & x > 2 \end{cases}$



State where the function is Continuous.

_____

State where the function is Discontinues.

_____

State any holes or asymptotes.

$f(-4) =$

$f(8) =$

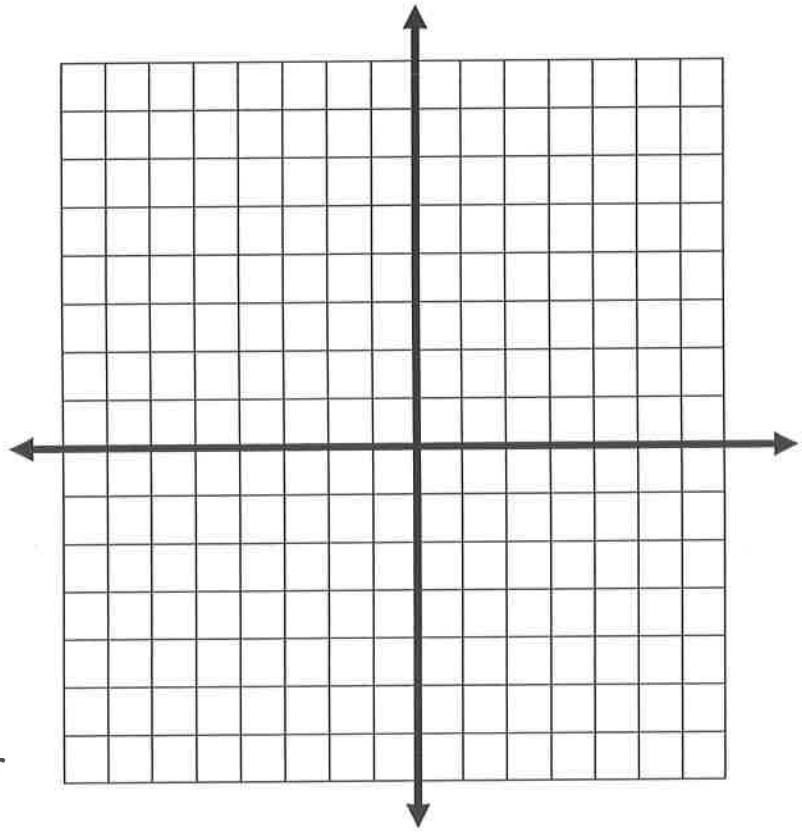
$f(2) =$

$\lim_{x \to 2^-} f(x) =$

$\lim_{x \to 2^+} f(x) =$

$\lim_{x \to 2} f(x) =$

4. $f(x) = \begin{cases} x^2-1 & x \le 0 \\ 2x-1 & 0 < x \le 5 \\ 3 & x > 5 \end{cases}$



State where the function is Continuous.

_____

State where the function is Discontinues.

_____

State any holes or asymptotes.

$f(-2) =$

$f(0) =$

$f(5) =$

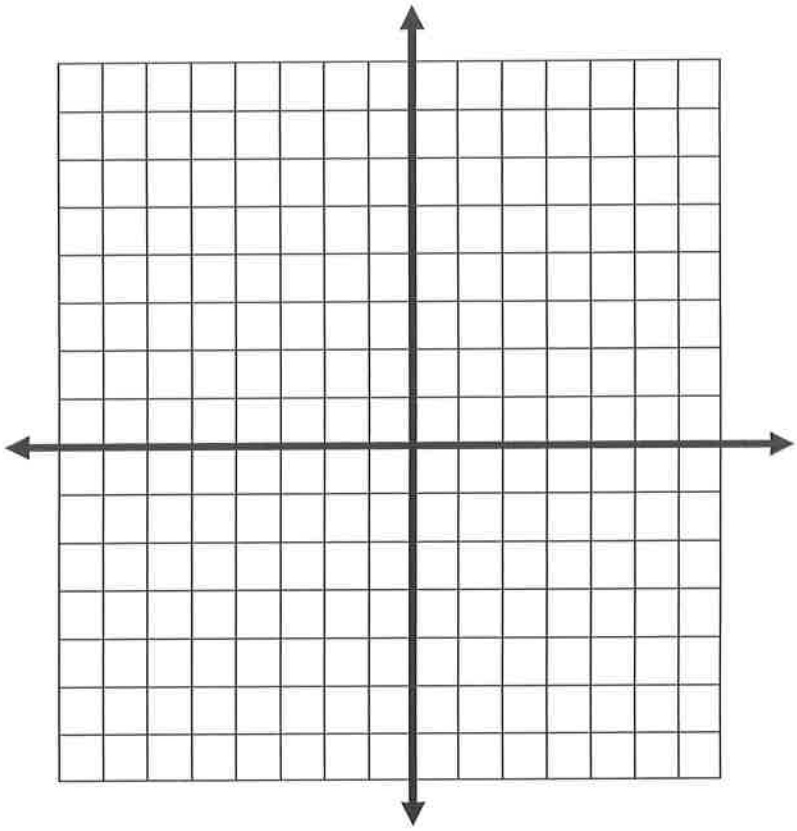
$\lim_{x \to 0} f(x) =$

$\lim_{x \to 5^-} f(x) =$

$\lim_{x \to 5^+} f(x) =$

$\lim_{x \to 5} f(x) =$

5. $f(x) = \begin{cases} x^2 & x \le 0 \\ -x^2 + 4 & x > 0 \end{cases}$



State where the function is Continuous.

_____

State where the function is Discontinues.

_____

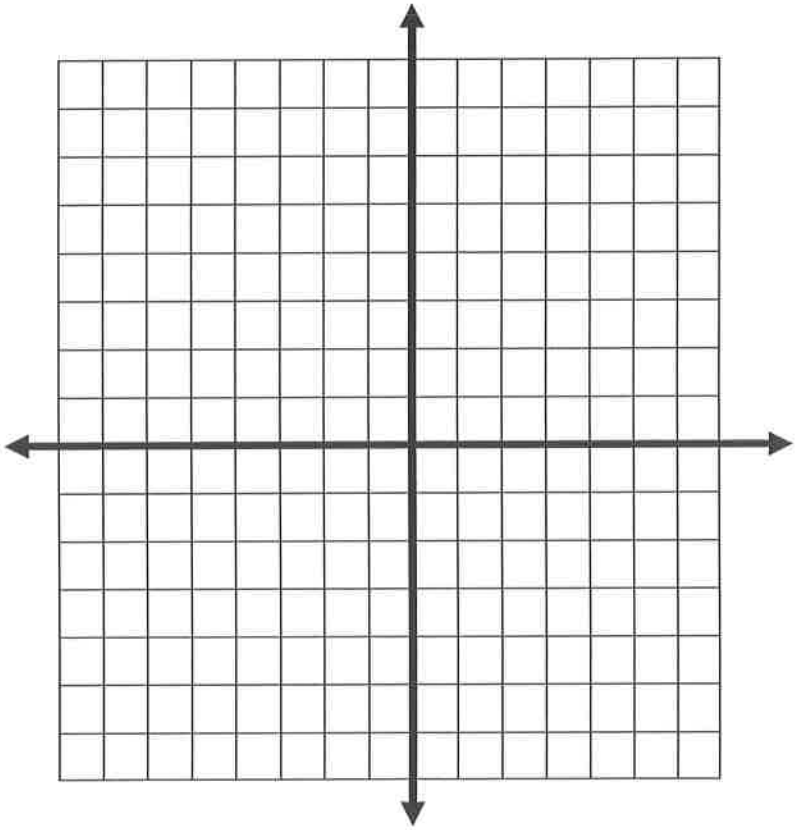
State any holes or asymptotes.

$f(-4) =$ $\lim_{x \to 0^-} f(x) =$

$f(0) =$ $\lim_{x \to 0^+} f(x) =$

$f(3) =$ $\lim_{x \to 0} f(x) =$

6. $f(x) = \begin{cases} 5 & x \le -3 \\ -2x - 3 & x > -3 \end{cases}$



State where the function is Continuous.

_____

State where the function is Discontinues.

_____

State any holes or asymptotes.

$f(-4) =$ $\lim_{x \to -3^-} f(x) =$

$f(0) =$ $\lim_{x \to -3^+} f(x) =$

$f(3) =$ $\lim_{x \to -3} f(x) =$