

## Limits of Piecewise Functions

Date \_\_\_\_\_ Period \_\_\_\_\_

**Evaluate each limit.**

1)  $\lim_{x \rightarrow -1} f(x), f(x) = \begin{cases} x^2 + 2x + 1, & x \neq -1 \\ 5, & x = -1 \end{cases}$

2)  $\lim_{x \rightarrow 1} f(x), f(x) = \begin{cases} x^2 - 4x + 1, & x \neq 1 \\ 1, & x = 1 \end{cases}$

3)  $\lim_{x \rightarrow -3} f(x), f(x) = \begin{cases} x^2 + 6x + 9, & x \neq -3 \\ 4, & x = -3 \end{cases}$

4)  $\lim_{x \rightarrow 0} f(x), f(x) = \begin{cases} \frac{x}{2} + \frac{5}{2}, & x \leq 0 \\ -2x - 5, & x > 0 \end{cases}$

5)  $\lim_{x \rightarrow 2} f(x), f(x) = \begin{cases} 2x - 4, & x < 2 \\ -x + 2, & x \geq 2 \end{cases}$

6)  $\lim_{x \rightarrow -1^+} f(x), f(x) = \begin{cases} -x^2 - 2x - 1, & x \leq -1 \\ 0, & x > -1 \end{cases}$

7)  $\lim_{x \rightarrow -3^-} f(x), f(x) = \begin{cases} x^2 + 6x + 9, & x < -3 \\ -x - 3, & x \geq -3 \end{cases}$

8)  $\lim_{x \rightarrow 2^-} f(x), f(x) = \begin{cases} 2x - 3, & x < 2 \\ -x^2 + 4x - 3, & x \geq 2 \end{cases}$

9)  $\lim_{x \rightarrow -1} f(x), f(x) = \begin{cases} -x - 3, & x \neq -1 \\ -5, & x = -1 \end{cases}$

10)  $\lim_{x \rightarrow 2} f(x), f(x) = \begin{cases} -x - 1, & x \neq 2 \\ -2, & x = 2 \end{cases}$

11)  $\lim_{x \rightarrow 3} f(x), f(x) = \begin{cases} -x + 1, & x \neq 3 \\ -3, & x = 3 \end{cases}$

12)  $\lim_{x \rightarrow 0} f(x), f(x) = \begin{cases} -x^2 + 3, & x \neq 0 \\ 2, & x = 0 \end{cases}$

13)  $\lim_{x \rightarrow -1} f(x), f(x) = \begin{cases} -x + 1, & x \neq -1 \\ 4, & x = -1 \end{cases}$

## Answers to Limits of Piecewise Functions (ID: 1)

1) 0

2) -2

3) 0

4) Does not exist.

5) 0

6) 0

7) 0

8) 1

9) -2

10) -3

11) -2

12) 3

13) 2