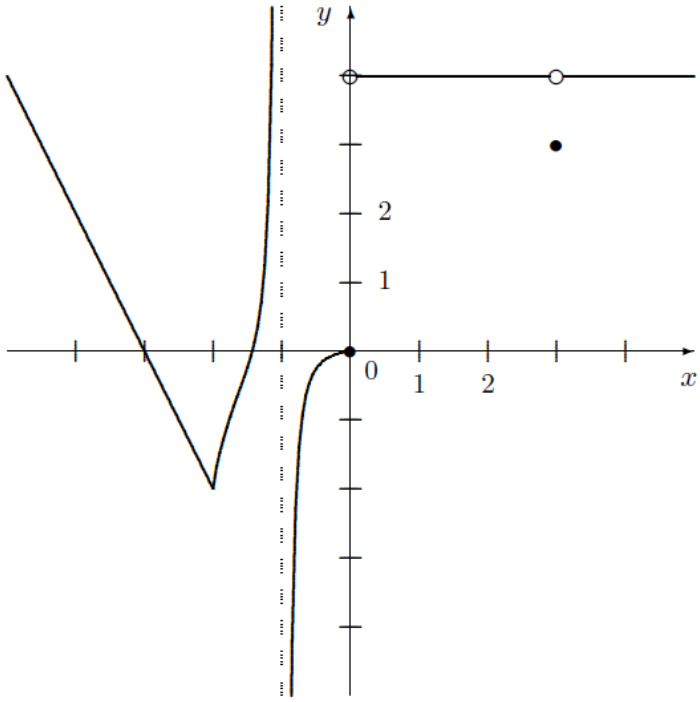
Calculus 3208

Worksheet 1: Limits of Piecewise Function Name:_____

1. Use the graph of $y = f(x)$ below to determine each of the following. Label the limits as ∞ or $-\infty$ where appropriate. If the limit does not exist or the value of the function is undefined, indicate this.



(a) $f(3) =$ (b) $\lim_{x\to 3^-} f(x) =$ (c) $\lim_{x\to 3^+} f(x) =$ (d) $\lim_{x\to 3} f(x) =$

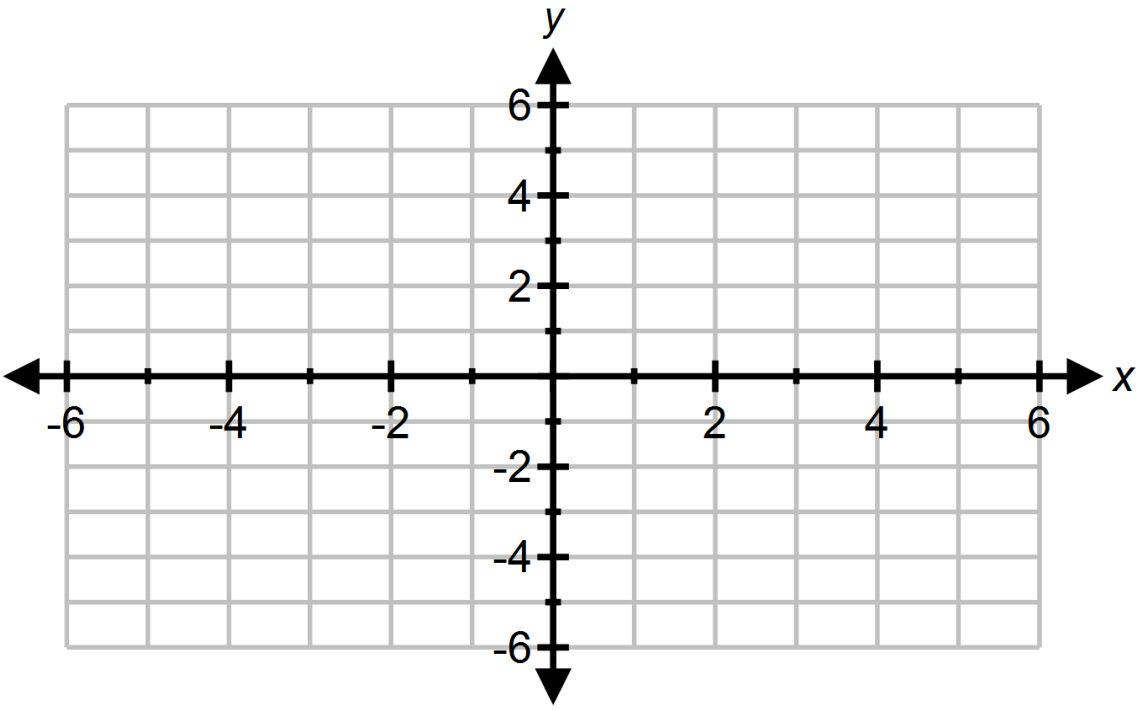
(e) $f(0) =$ (f) $\lim_{x\to 0^-} f(x) =$ (g) $\lim_{x\to 0^+} f(x) =$ (h) $\lim_{x\to 0} f(x) =$

(i) $f(-1) =$ (j) $\lim_{x\to -1^-} f(x) =$ (k) $\lim_{x\to -1^+} f(x) =$ (l) $\lim_{x\to -1} f(x) =$

(m) $f(-2) =$ (n) $\lim_{x\to -2^+} f(x) =$ (o) $\lim_{x\to -2^-} f(x) =$ (p) $\lim_{x\to -2} f(x) =$

2. Graph the piecewise $f(x)=\begin{cases} -x, & x<-2 \\ \frac{1}{2}x^2-1, & -2\le x<2 \\ -x+3, & x>2 \end{cases}$

(a)



(b) Use the graph you drew in part (a) to determine each of the following. Label the limits as ∞ or $-\infty$ where appropriate. If the limit does not exist or the value of the function is undefined, indicate this.

(i) $f(-2)=$

(ii) $\lim\limits_{x\to -2^-} f(x)=$

(iii) $\lim\limits_{x\to -2^+} f(x)=$

(iv) $\lim\limits_{x\to -2} f(x)=$

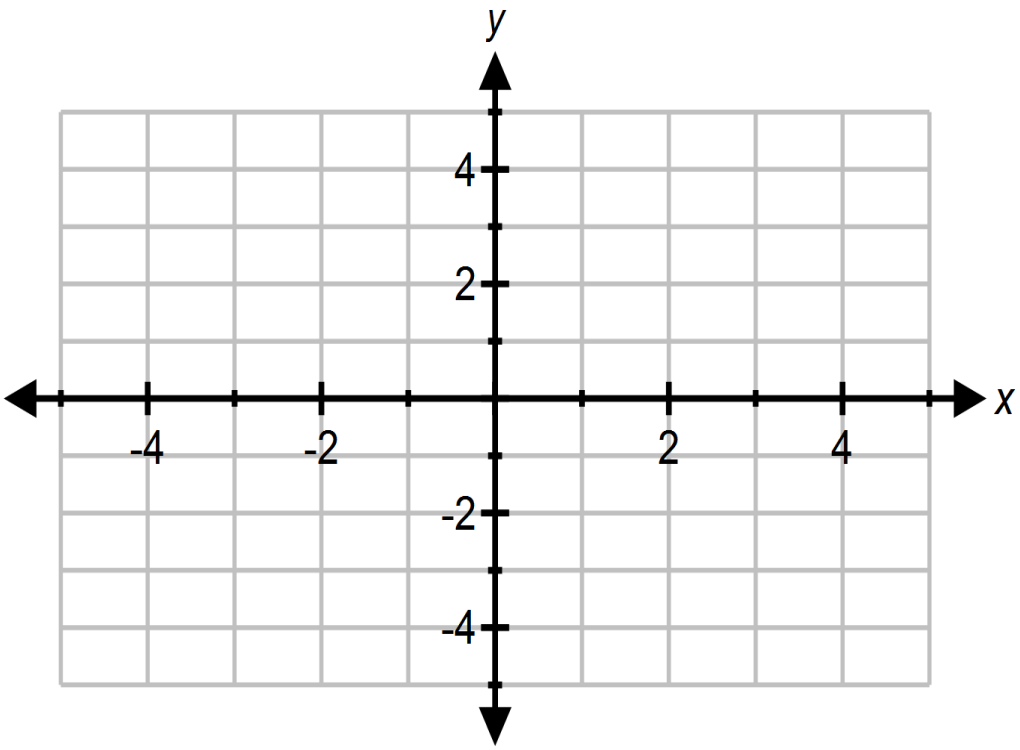
(v) $f(2)=$

(vi) $\lim\limits_{x\to 2^-} f(x)=$

(vii) $\lim\limits_{x\to 2^+} f(x)=$

(viii) $\lim\limits_{x\to 2} f(x)=$

(ix) $\lim\limits_{x\to -1} f(x)=$


y
x
4
2
-2
-4
-4
-2
2
4