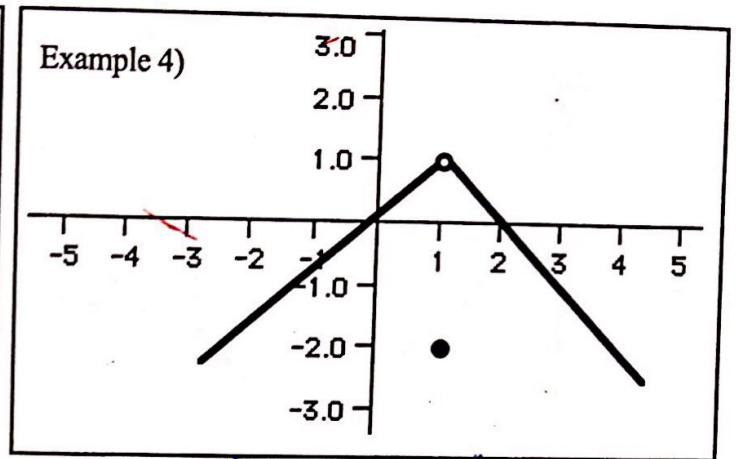


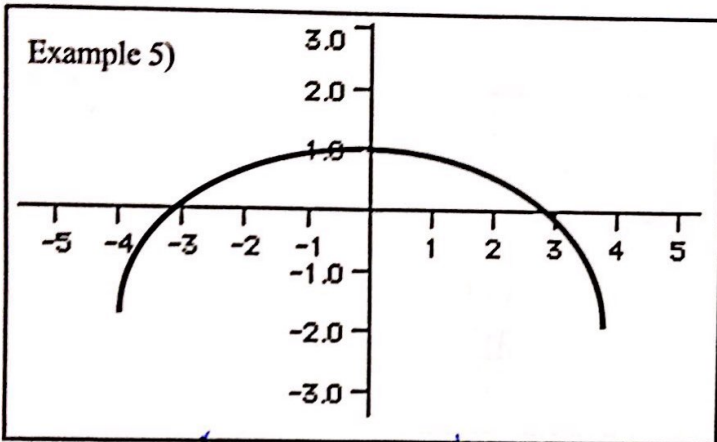
$$\lim_{x \rightarrow 1^-} f(x) = 1 \quad \lim_{x \rightarrow 1^+} f(x) = 1$$

$$\lim_{x \rightarrow 1} f(x) = 1 \quad f(1) = \text{DNE}$$



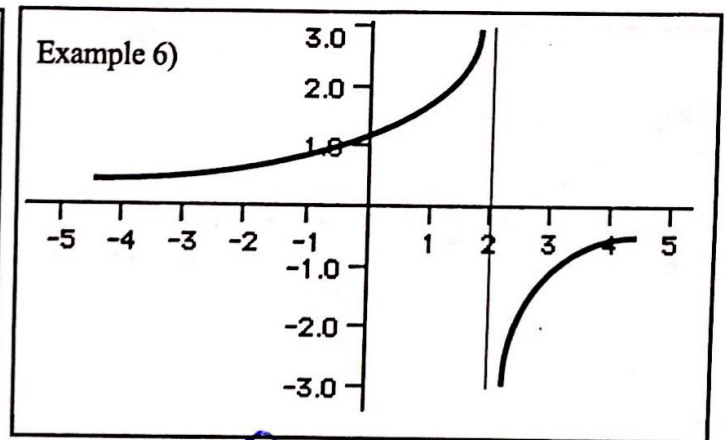
$$\lim_{x \rightarrow 1^-} f(x) = 1 \quad \lim_{x \rightarrow 1^+} f(x) = 1$$

$$\lim_{x \rightarrow 1} f(x) = 1 \quad f(1) = -2$$



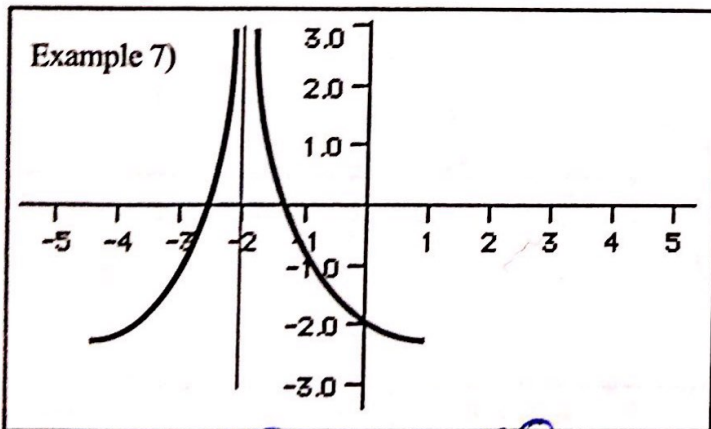
$$\lim_{x \rightarrow 0^-} f(x) = 1 \quad \lim_{x \rightarrow 0^+} f(x) = 1$$

$$\lim_{x \rightarrow 0} f(x) = 1 \quad f(0) = 1$$



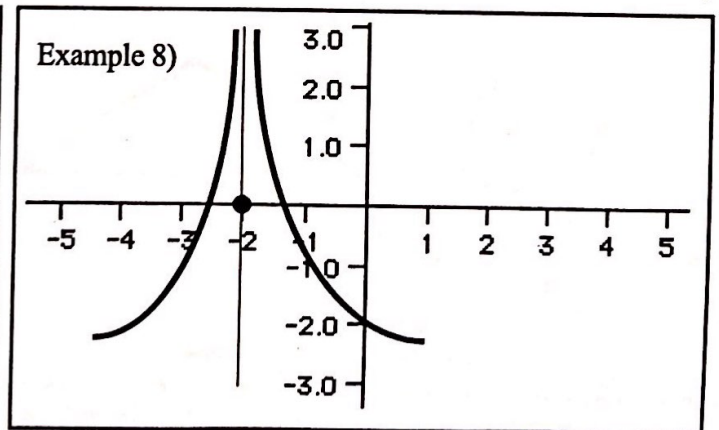
$$\lim_{x \rightarrow 2^-} f(x) = \infty \quad \lim_{x \rightarrow 2^+} f(x) = \infty$$

$$\lim_{x \rightarrow 2} f(x) = \text{DNE} \quad f(2) = \text{DNE}$$



$$\lim_{x \rightarrow -2^-} f(x) = \infty \quad \lim_{x \rightarrow -2^+} f(x) = \infty$$

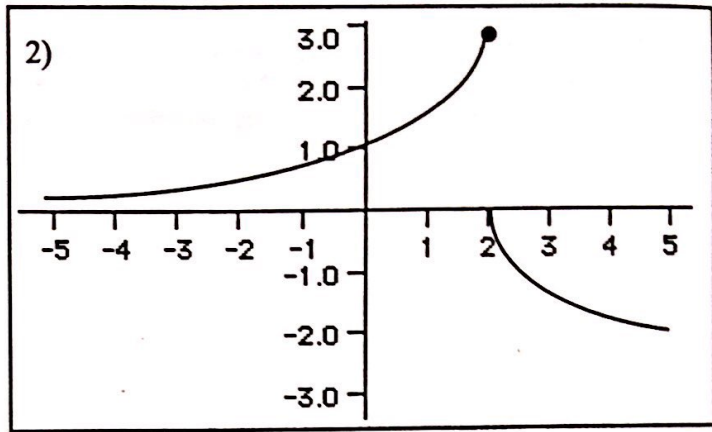
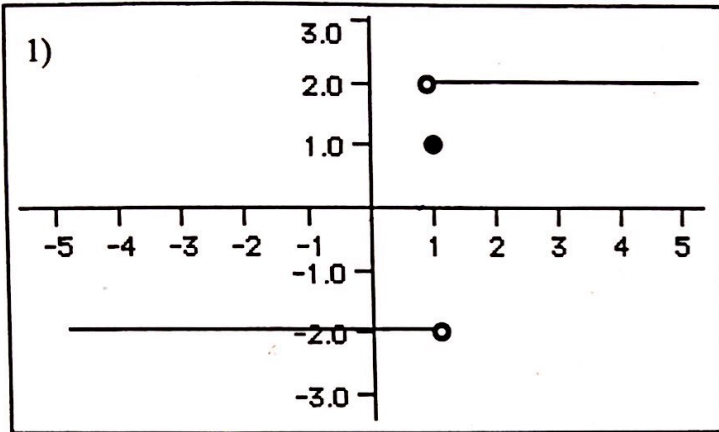
$$\lim_{x \rightarrow -2} f(x) = \infty \quad f(-2) = \text{DNE}$$



$$\lim_{x \rightarrow -2^-} f(x) = \infty \quad \lim_{x \rightarrow -2^+} f(x) = \infty$$

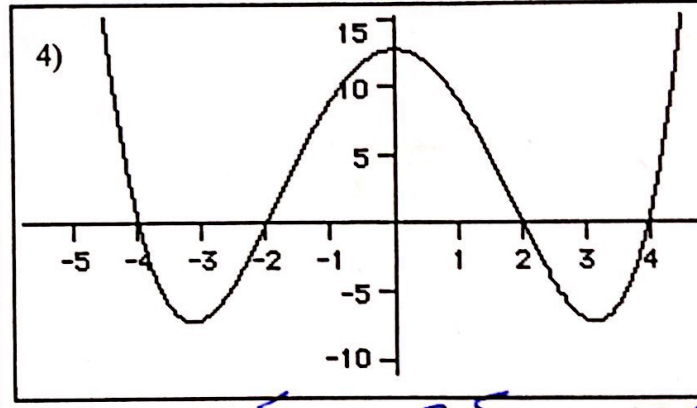
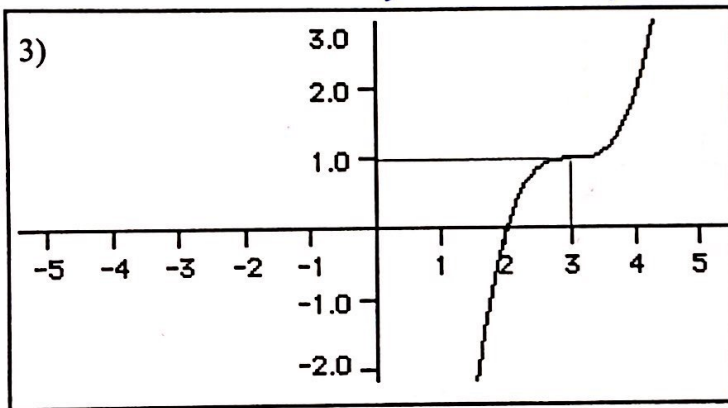
$$\lim_{x \rightarrow -2} f(x) = \infty \quad f(-2) = 0$$

# Graphical Approach to Limits - Homework



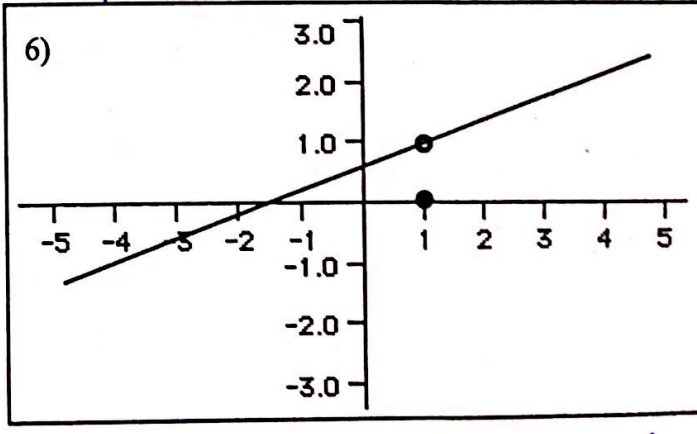
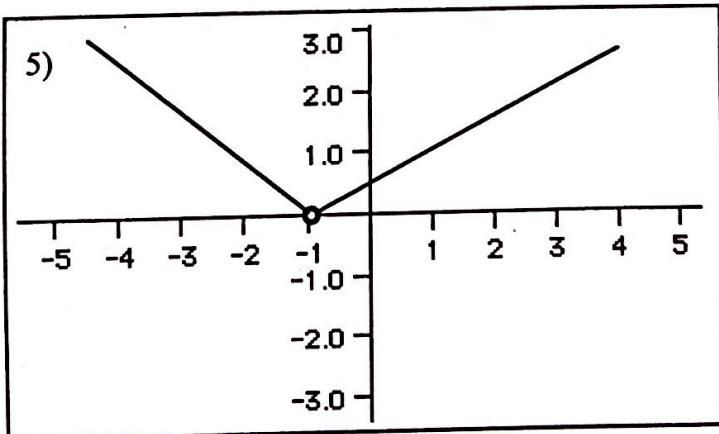
- a)  $\lim_{x \rightarrow 1^-} f(x)$   $-2$     b)  $\lim_{x \rightarrow 1^+} f(x)$   $2$     c)  $\lim_{x \rightarrow 1} f(x)$  **DNE**  
 d)  $f(1)$   $1$     e)  $\lim_{x \rightarrow \infty} f(x)$   $-2$     f)  $\lim_{x \rightarrow -\infty} f(x)$   $2$

- a)  $\lim_{x \rightarrow 2^-} f(x)$   $3$     b)  $\lim_{x \rightarrow 2^+} f(x)$   $0$     c)  $\lim_{x \rightarrow 2} f(x)$  **DNE**  
 d)  $f(2)$   $3$     e)  $\lim_{x \rightarrow \infty} f(x)$   $0$     f)  $\lim_{x \rightarrow -\infty} f(x)$   $-0$



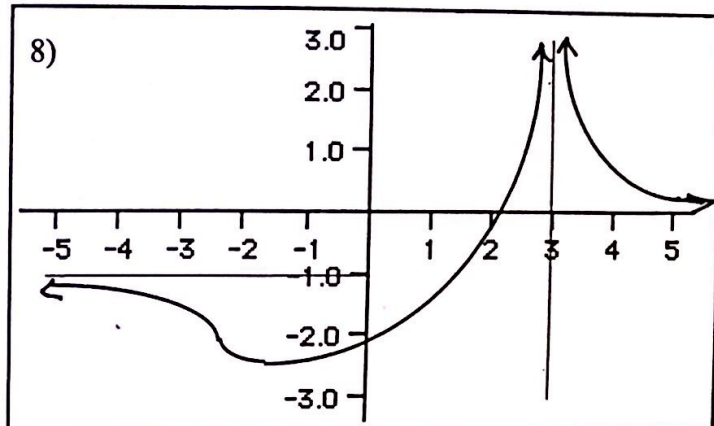
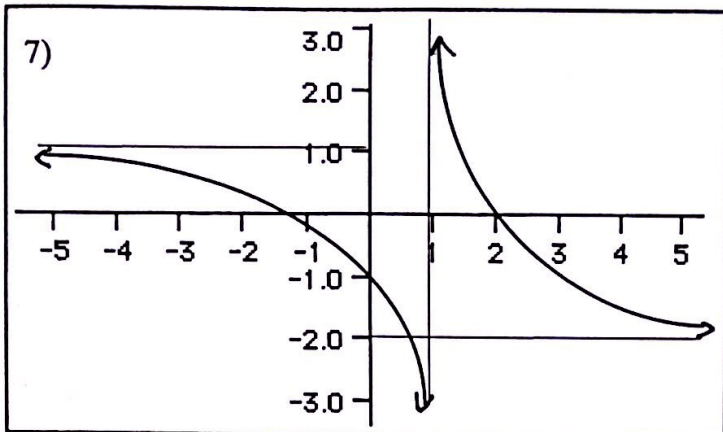
- a)  $\lim_{x \rightarrow 3^-} f(x)$   $1$     b)  $\lim_{x \rightarrow 3^+} f(x)$   $1$     c)  $\lim_{x \rightarrow 3} f(x)$   $1$   
 d)  $f(3)$   $1$     e)  $\lim_{x \rightarrow -\infty} f(x)$   $-\infty$     f)  $\lim_{x \rightarrow \infty} f(x)$   $\infty$

- a)  $\lim_{x \rightarrow 0^-} f(x)$   $12.5$     b)  $\lim_{x \rightarrow 0^+} f(x)$   $12.5$     c)  $\lim_{x \rightarrow 0} f(x)$   $12.5$   
 d)  $f(0)$   $12.5$     e)  $\lim_{x \rightarrow \infty} f(x)$   $\infty$     f)  $\lim_{x \rightarrow -\infty} f(x)$   $\infty$

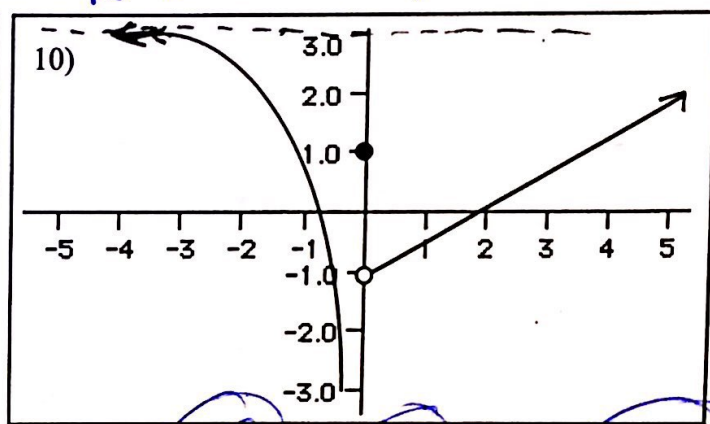
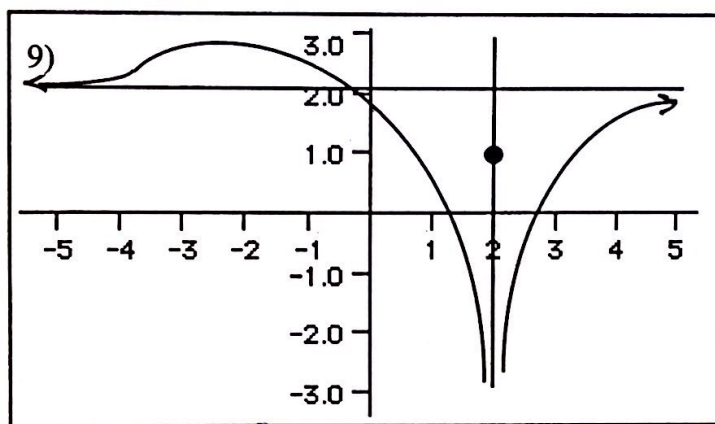


- a)  $\lim_{x \rightarrow -1^-} f(x)$   $0$     b)  $\lim_{x \rightarrow -1^+} f(x)$   $0$     c)  $\lim_{x \rightarrow -1} f(x)$   $0$   
 d)  $f(-1)$  **DNE**    e)  $\lim_{x \rightarrow -\infty} f(x)$   $\infty$     f)  $\lim_{x \rightarrow \infty} f(x)$   $\infty$

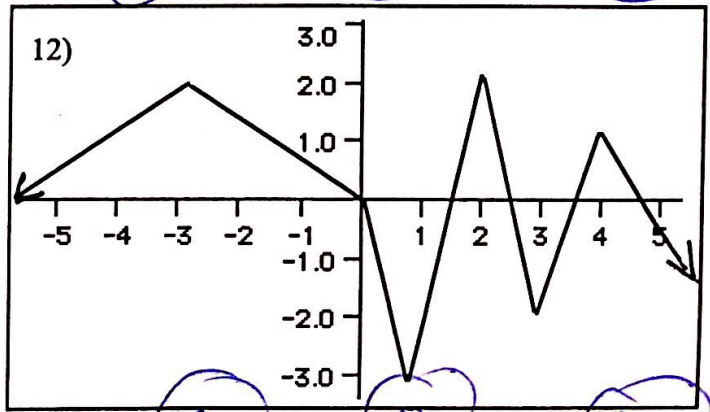
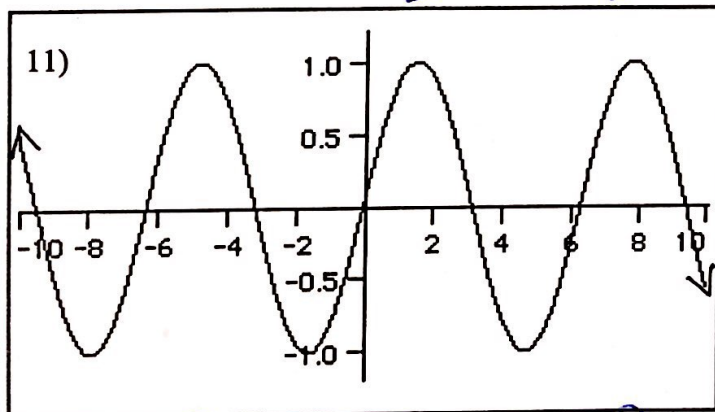
- a)  $\lim_{x \rightarrow 1^-} f(x)$   $1$     b)  $\lim_{x \rightarrow 1^+} f(x)$   $1$     c)  $\lim_{x \rightarrow 1} f(x)$   $1$   
 d)  $f(1)$   $0$     e)  $\lim_{x \rightarrow \infty} f(x)$   $-\infty$     f)  $\lim_{x \rightarrow -\infty} f(x)$   $\infty$



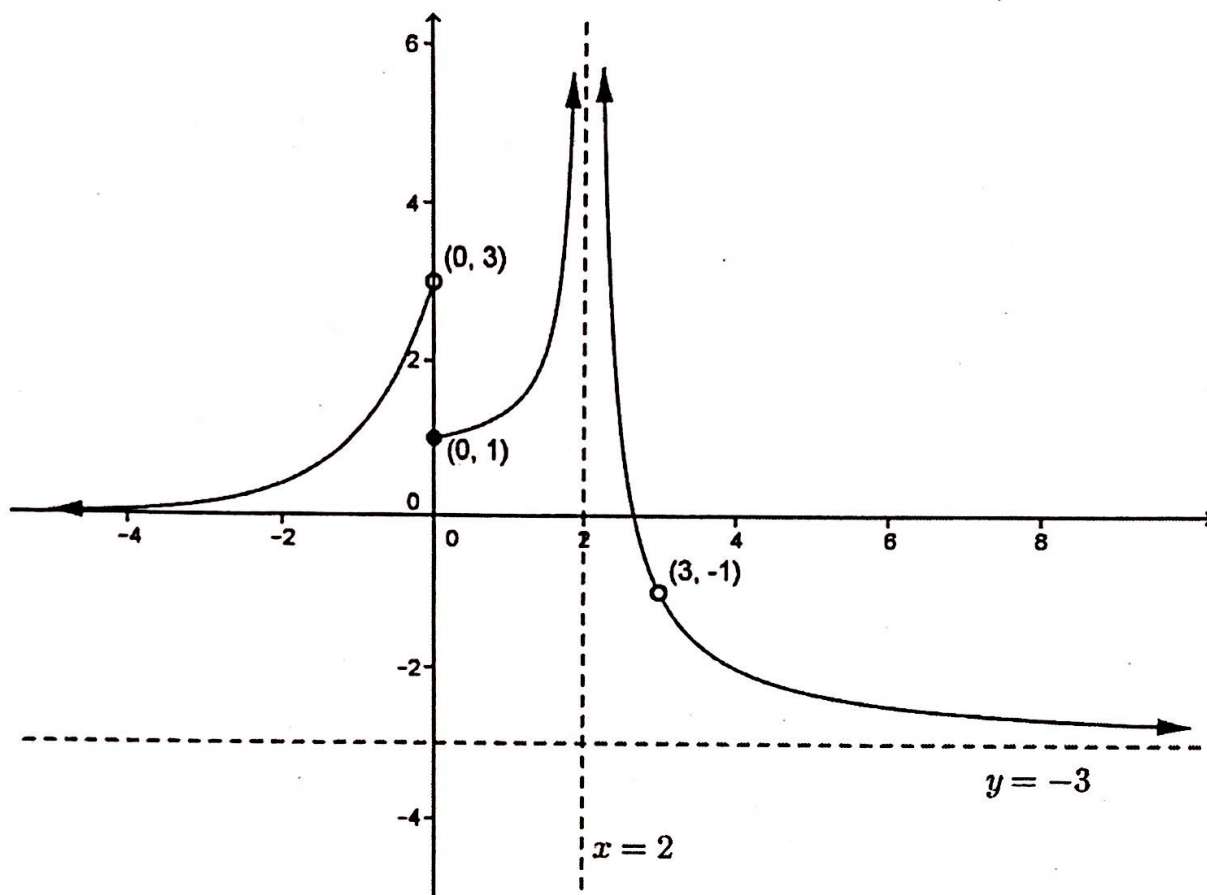
- 7) a)  $\lim_{x \rightarrow 1^-} f(x) = -\infty$  b)  $\lim_{x \rightarrow 1^+} f(x) = \infty$  c)  $\lim_{x \rightarrow 1} f(x) = \text{DNE}$   
 d)  $f(1) = \text{DNE}$  e)  $\lim_{x \rightarrow -\infty} f(x) = 1$  f)  $\lim_{x \rightarrow \infty} f(x) = 1$
- 8) a)  $\lim_{x \rightarrow 3^-} f(x) = -\infty$  b)  $\lim_{x \rightarrow 3^+} f(x) = \infty$  c)  $\lim_{x \rightarrow 3} f(x) = \text{DNE}$   
 d)  $f(3) = \text{DNE}$  e)  $\lim_{x \rightarrow -\infty} f(x) = 1$  f)  $\lim_{x \rightarrow \infty} f(x) = 1$



- 9) a)  $\lim_{x \rightarrow 2^-} f(x) = \infty$  b)  $\lim_{x \rightarrow 2^+} f(x) = -\infty$  c)  $\lim_{x \rightarrow 2} f(x) = \text{DNE}$   
 d)  $f(2) = 1$  e)  $\lim_{x \rightarrow -\infty} f(x) = 2$  f)  $\lim_{x \rightarrow \infty} f(x) = 2$
- 10) a)  $\lim_{x \rightarrow 0^-} f(x) = \infty$  b)  $\lim_{x \rightarrow 0^+} f(x) = -\infty$  c)  $\lim_{x \rightarrow 0} f(x) = \text{DNE}$   
 d)  $f(0) = 1$  e)  $\lim_{x \rightarrow -\infty} f(x) = 1$  f)  $\lim_{x \rightarrow \infty} f(x) = 1$



- 11) a)  $\lim_{x \rightarrow 0^-} f(x) = 0$  b)  $\lim_{x \rightarrow 0^+} f(x) = 0$  c)  $\lim_{x \rightarrow 0} f(x) = 0$   
 d)  $f(0) = 0$  e)  $\lim_{x \rightarrow -\infty} f(x) = \text{DNE}$  f)  $\lim_{x \rightarrow \infty} f(x) = \text{DNE}$
- 12) a)  $\lim_{x \rightarrow 0^-} f(x) = 0$  b)  $\lim_{x \rightarrow 0^+} f(x) = 0$  c)  $\lim_{x \rightarrow 0} f(x) = 0$   
 d)  $f(0) = 0$  e)  $\lim_{x \rightarrow -\infty} f(x) = -\infty$  f)  $\lim_{x \rightarrow \infty} f(x) = -\infty$



1.  $\lim_{x \rightarrow -\infty} f(x) = 0$

2.  $\lim_{x \rightarrow 0^-} f(x) = 3$

3.  $\lim_{x \rightarrow 0^+} f(x) = 1$

4.  $\lim_{x \rightarrow 2^-} f(x) = \infty$

5.  $\lim_{x \rightarrow 2^+} f(x) = \infty$

6.  $\lim_{x \rightarrow 2} f(x) = \infty$

7.  $\lim_{x \rightarrow 0} f(x) = \text{DNE}$

8.  $\lim_{x \rightarrow 3^-} f(x) = -1$

9.  $\lim_{x \rightarrow 3^+} f(x) = -1$

10.  $\lim_{x \rightarrow 3} f(x) = -1$

11.  $\lim_{x \rightarrow \infty} f(x) = -3$