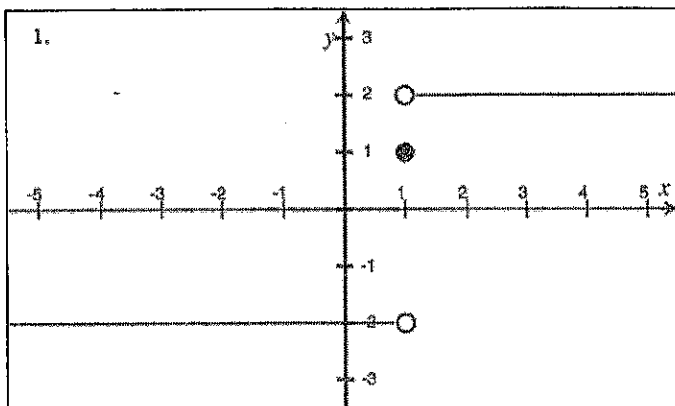
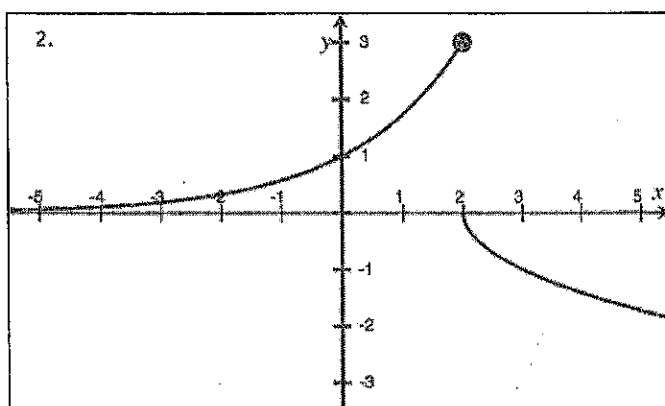


# 4. Graphical Approach to Limits – Homework

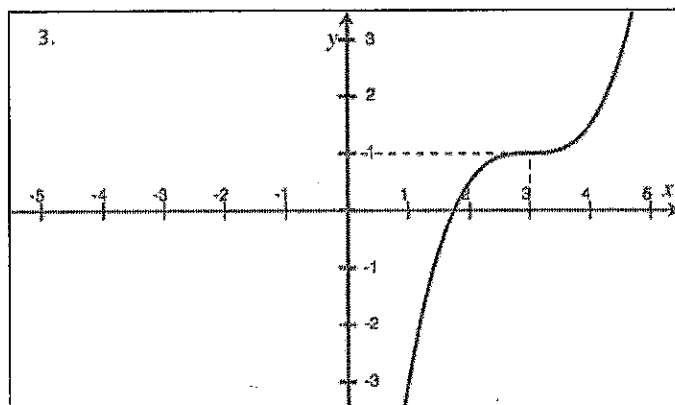
Key



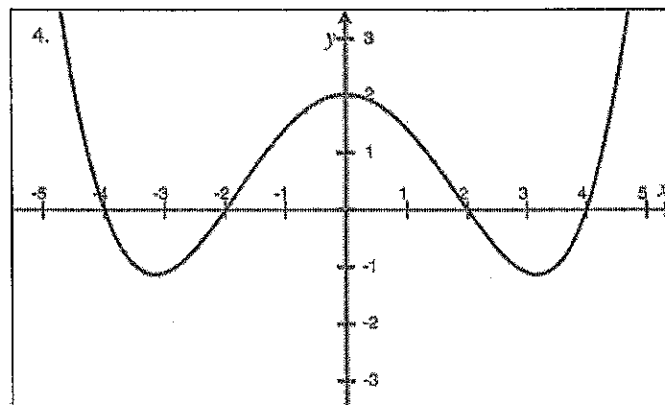
1. a)  $\lim_{x \rightarrow 1^-} f(x) = \underline{-2}$  b)  $\lim_{x \rightarrow 1^+} f(x) = \underline{2}$  c)  $\lim_{x \rightarrow 1} f(x) = \underline{DNE}$   
 d)  $f(1) = \underline{1}$  e)  $\lim_{x \rightarrow -\infty} f(x) = \underline{-2}$  f)  $\lim_{x \rightarrow \infty} f(x) = \underline{2}$



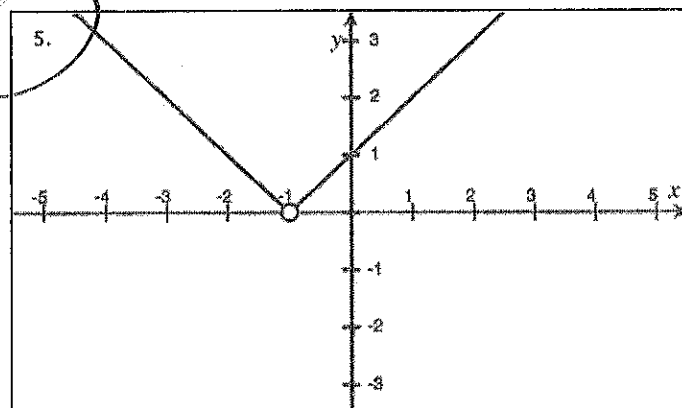
2. a)  $\lim_{x \rightarrow 2^-} f(x) = \underline{3}$  b)  $\lim_{x \rightarrow 2^+} f(x) = \underline{0}$  c)  $\lim_{x \rightarrow 2} f(x) = \underline{DNE}$   
 d)  $f(2) = \underline{3}$  e)  $\lim_{x \rightarrow -\infty} f(x) = \underline{0}$  f)  $\lim_{x \rightarrow \infty} f(x) = \underline{-\infty}$  or  $\underline{-2}$ ?



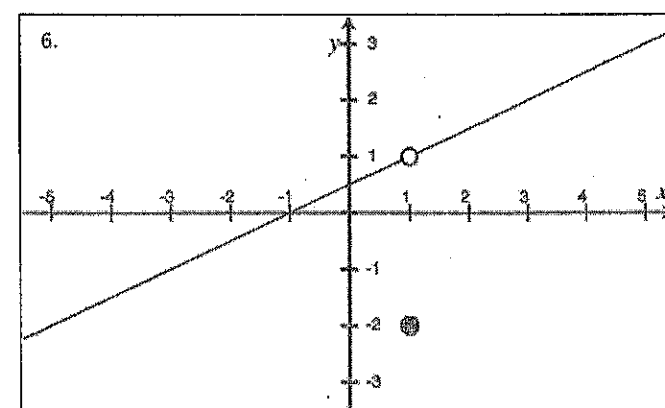
3. a)  $\lim_{x \rightarrow 3^-} f(x) = \underline{1}$  b)  $\lim_{x \rightarrow 3^+} f(x) = \underline{1}$  c)  $\lim_{x \rightarrow 3} f(x) = \underline{1}$   
 d)  $f(3) = \underline{1}$  e)  $\lim_{x \rightarrow -\infty} f(x) = \underline{-\infty}$  f)  $\lim_{x \rightarrow \infty} f(x) = \underline{\infty}$



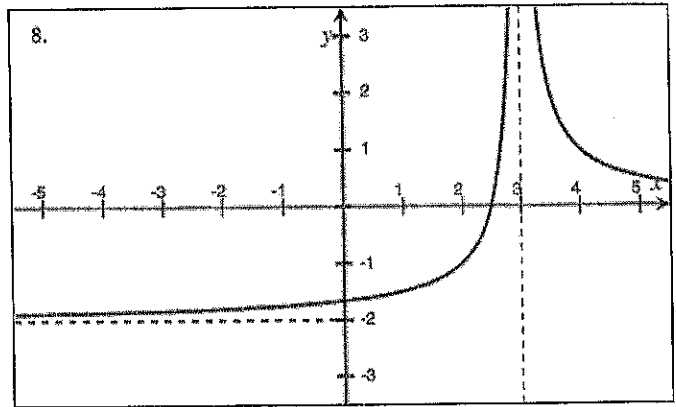
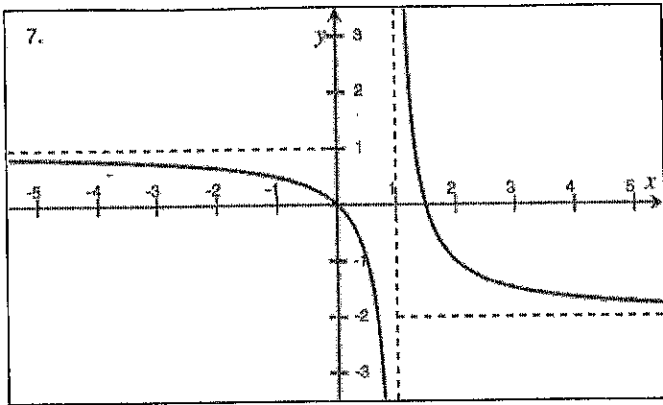
4. a)  $\lim_{x \rightarrow 0^-} f(x) = \underline{2}$  b)  $\lim_{x \rightarrow 0^+} f(x) = \underline{2}$  c)  $\lim_{x \rightarrow 0} f(x) = \underline{2}$   
 d)  $f(0) = \underline{2}$  e)  $\lim_{x \rightarrow -\infty} f(x) = \underline{\infty}$  f)  $\lim_{x \rightarrow \infty} f(x) = \underline{\infty}$



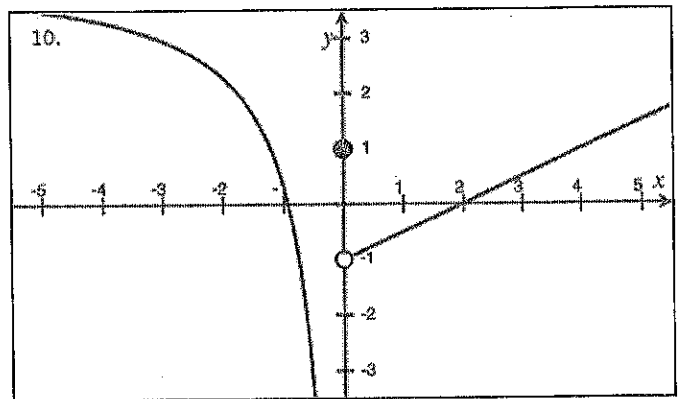
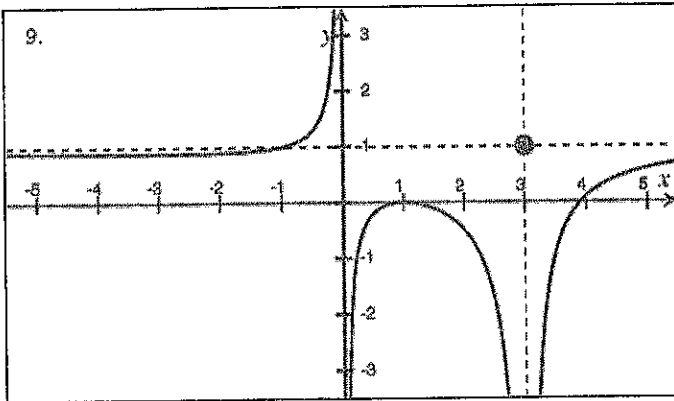
5. a)  $\lim_{x \rightarrow 1^-} f(x) = \underline{0}$  b)  $\lim_{x \rightarrow 1^+} f(x) = \underline{0}$  c)  $\lim_{x \rightarrow 1} f(x) = \underline{0}$   
 d)  $f(1) = \underline{und}$  e)  $\lim_{x \rightarrow -\infty} f(x) = \underline{\infty}$  f)  $\lim_{x \rightarrow \infty} f(x) = \underline{\infty}$



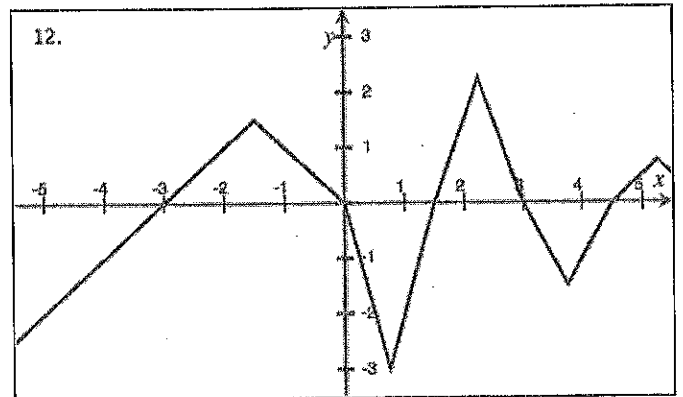
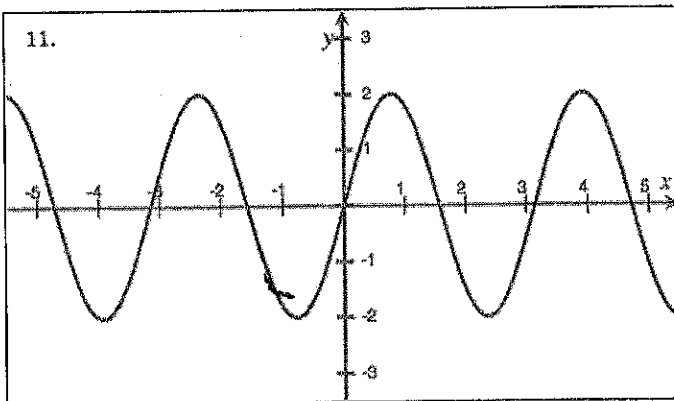
6. a)  $\lim_{x \rightarrow 1^-} f(x) = \underline{1}$  b)  $\lim_{x \rightarrow 1^+} f(x) = \underline{1}$  c)  $\lim_{x \rightarrow 1} f(x) = \underline{1}$   
 d)  $f(1) = \underline{-2}$  e)  $\lim_{x \rightarrow -\infty} f(x) = \underline{-\infty}$  f)  $\lim_{x \rightarrow \infty} f(x) = \underline{\infty}$



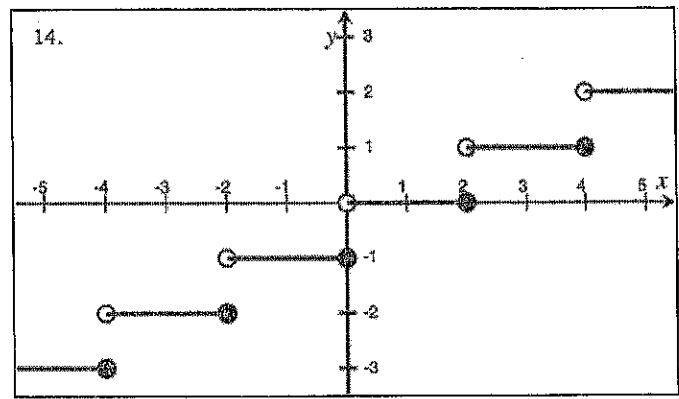
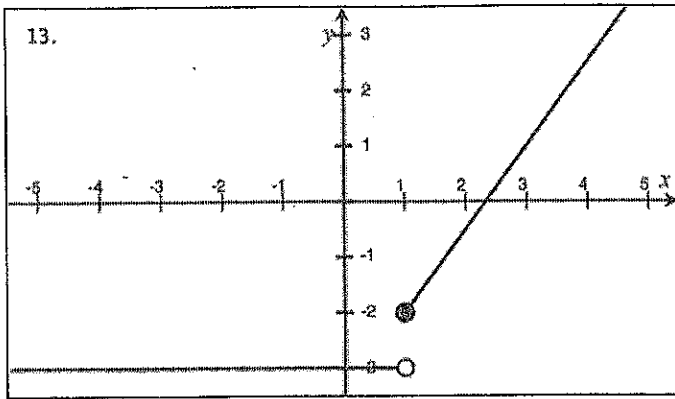
- a)  $\lim_{x \rightarrow 1^-} f(x) = -\infty$  b)  $\lim_{x \rightarrow 1^+} f(x) = \infty$  c)  $\lim_{x \rightarrow 1} f(x) = \text{DNE}$  a)  $\lim_{x \rightarrow 3^-} f(x) = \infty$  b)  $\lim_{x \rightarrow 3^+} f(x) = -\infty$  c)  $\lim_{x \rightarrow 3} f(x) = \text{DNE}$   
 d)  $f(1) = \text{DNE}$  e)  $\lim_{x \rightarrow -\infty} f(x) = -2$  f)  $\lim_{x \rightarrow \infty} f(x) = -2$  d)  $f(3) = \text{DNE}$  e)  $\lim_{x \rightarrow -\infty} f(x) = -2$  f)  $\lim_{x \rightarrow \infty} f(x) = -2$



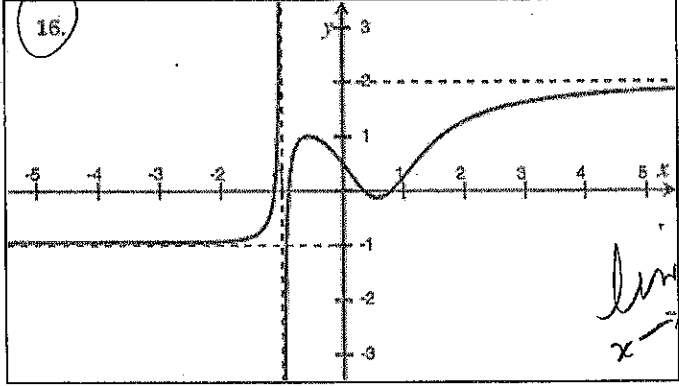
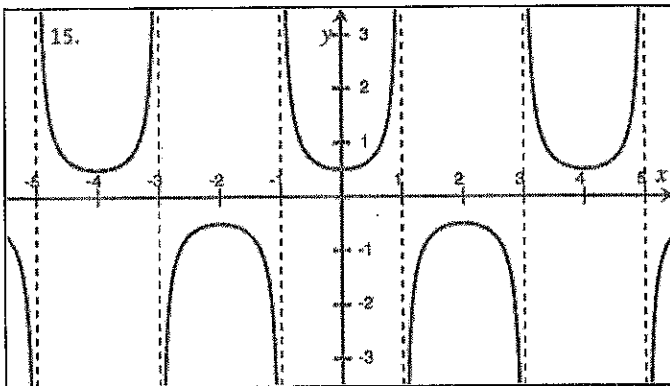
- a)  $\lim_{x \rightarrow 3^-} f(x) = \infty$  b)  $\lim_{x \rightarrow 3^+} f(x) = -\infty$  c)  $\lim_{x \rightarrow 3} f(x) = \text{DNE}$  a)  $\lim_{x \rightarrow 0^-} f(x) = -\infty$  b)  $\lim_{x \rightarrow 0^+} f(x) = -1$  c)  $\lim_{x \rightarrow 0} f(x) = \text{DNE}$   
 d)  $f(3) = 1$  e)  $\lim_{x \rightarrow -\infty} f(x) = 1$  f)  $\lim_{x \rightarrow \infty} f(x) = 1$  d)  $f(0) = -1$  e)  $\lim_{x \rightarrow -\infty} f(x) = \infty$  f)  $\lim_{x \rightarrow \infty} f(x) = \infty$



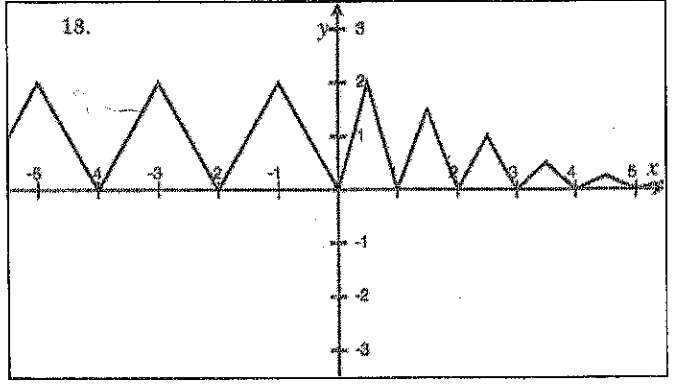
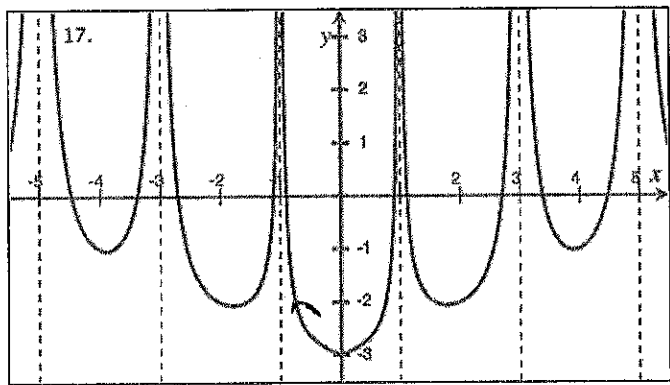
- a)  $\lim_{x \rightarrow 0^-} f(x) = 0$  b)  $\lim_{x \rightarrow 0^+} f(x) = 0$  c)  $\lim_{x \rightarrow 0} f(x) = 0$  a)  $\lim_{x \rightarrow 0^-} f(x) = 0$  b)  $\lim_{x \rightarrow 0^+} f(x) = 0$  c)  $\lim_{x \rightarrow 0} f(x) = 0$   
 d)  $f(0) = 0$  e)  $\lim_{x \rightarrow -\infty} f(x)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



- a)  $\lim_{x \rightarrow 1^-} f(x) = \underline{-3}$  b)  $\lim_{x \rightarrow 1^+} f(x) = \underline{-2}$  c)  $\lim_{x \rightarrow 1} f(x) = \underline{DNE}$  a)  $\lim_{x \rightarrow 0^-} f(x) = \underline{-1}$  b)  $\lim_{x \rightarrow 0^+} f(x) = \underline{0}$  c)  $\lim_{x \rightarrow 0} f(x) = \underline{DNE}$   
 d)  $f(1) = \underline{-2}$  e)  $\lim_{x \rightarrow -\infty} f(x) = \underline{-3}$  f)  $\lim_{x \rightarrow \infty} f(x) = \underline{\infty}$  d)  $f(0) = \underline{-1}$  e)  $\lim_{x \rightarrow -\infty} f(x) = \underline{DNE}$  f)  $\lim_{x \rightarrow \infty} f(x) = \underline{DNE}$



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



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