

# Math 1431 – Section 17699

EMCF 1

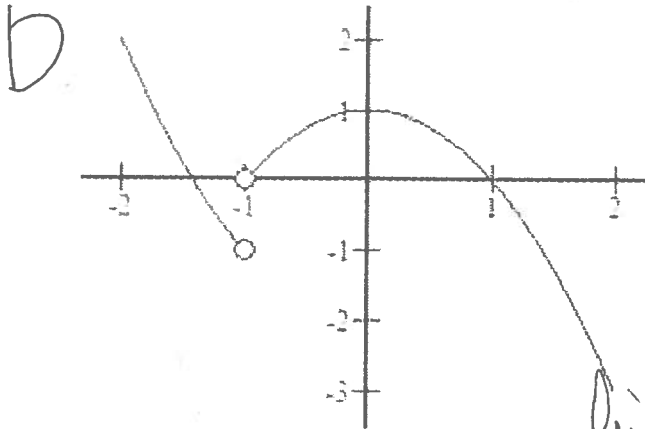
Due Fri. 1/30 at 11:59pm

*Sol.*

Instructions

- Submit this assignment at <http://www.casa.uh.edu> under "EMCF" and choose **EMCF 1**.

1. The graph of  $f$  is shown below. Give  $\lim_{x \rightarrow -1} f(x)$ .



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

$$0 \neq -1$$

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

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

- a. -1
- b. 0
- c. 1
- d. Does not exist.
- e. None of these.

**B** 2. Give  $\lim_{x \rightarrow 1} \frac{x^2 - 1}{x - 1}$ .  $\frac{0}{0} \Rightarrow$  undetermined term  $\Rightarrow$  common factor on the top and bottom

$$\lim_{x \rightarrow 1} \frac{(x+1)(x-1)}{x-1} = \lim_{x \rightarrow 1} (x+1) = 2$$

- a. 0
- b. 2
- c. 1
- d. The limit does not exist.
- e. None of these.

**B** 3. Give  $\lim_{x \rightarrow -2} (2x - 3)$ .  $= 2(-2) - 3 = -4 - 3 = -7$

- a. 1
- b. -7
- c. -1
- d. The limit does not exist.
- e. None of these.

4. Give  $\lim_{x \rightarrow 2} \frac{x^2 + 4x + 4}{x^2 - 4} = \lim_{x \rightarrow 2} \frac{(x+2)^2}{(x+2)(x-2)} = \lim_{x \rightarrow 2} \frac{x+2}{x-2} = \frac{4}{0}$  DNE

- a. 1  
b. 2  
c. 3  
d. The limit does not exist.  
e. None of these.

5.  $\lim_{x \rightarrow -1} \frac{x^2 - 3x - 4}{x^2 - 1} = \lim_{x \rightarrow -1} \frac{(x+1)(x-4)}{(x+1)(x-1)} = \lim_{x \rightarrow -1} \frac{x-4}{x-1} = \frac{-5}{-2} = \frac{5}{2}$

- a. 3  
b. 5/2  
c. DNE  
d. 3/2  
e. -1/2  
f. None of these.

6.  $\lim_{x \rightarrow 4} \frac{4-x}{2-\sqrt{x}} = \lim_{x \rightarrow 4} \frac{(4-x) \cdot (2+\sqrt{x})}{(2-\sqrt{x})(2+\sqrt{x})} = \lim_{x \rightarrow 4} \frac{(4-x)(2+\sqrt{x})}{4-x} = \lim_{x \rightarrow 4} 2+\sqrt{x} = 2+\sqrt{4} = 4$

- a. 3  
b. 4  
c. DNE  
d. -1  
e. 2  
f. None of these.

7.  $\lim_{x \rightarrow 1} \frac{|x-1|}{x-1} = \begin{cases} 1 & x-1 > 0 \\ -1 & x-1 < 0 \end{cases}$

- a. 3  
b. 2  
c. DNE  
d. 0  
e. 1  
f. None of these.

$\lim_{x \rightarrow 1^+} \frac{|x-1|}{x-1} = 1 \neq -1 = \lim_{x \rightarrow 1^-} \frac{|x-1|}{x-1} \Rightarrow \lim_{x \rightarrow 1} \frac{|x-1|}{x-1} \text{ DNE.}$

8. Let  $g(x) = \frac{x^2 - 3x - 4}{x-1}$ . Give  $\lim_{x \rightarrow 1} g(x) = \lim_{x \rightarrow 1} \frac{(x-1)(x+4)}{(x-1)} = \lim_{x \rightarrow 1} x+4 = 5$

- a. 5  
b. 3  
c. DNE  
d. -4  
e. 0  
f. None of these.

9.  $\lim_{x \rightarrow 1} \frac{2x-3}{x^2-2x+2} = \frac{2-3}{1-2+2} = \frac{-1}{1} = -1$

- a. 3
- b. 4
- c. DNE
- d. -1
- e. 2
- f. None of these.

10.  $\lim_{x \rightarrow 1} \frac{x^3-1}{x^2+x-2} = \lim_{x \rightarrow 1} \frac{(x-1)(x^2+x+1)}{(x-1)(x+2)} = \lim_{x \rightarrow 1} \frac{x^2+x+1}{x+2}$   
 $= \frac{1+1+1}{1+2} = \frac{3}{3} = 1$

- a. 1/2
- b. 1/3
- c. DNE
- d. 0
- e. 1
- f. None of these.

$$\frac{(x^3-1)}{x-1} \Rightarrow$$

$$\begin{array}{r} | + 0 + 0 - 1 | \quad \perp \\ + | + | + | \\ \hline | + | + | \quad \perp 0 \end{array}$$

$$x^2 + x + 1$$

