

**Pre-Med Calculus**  
**Pre-Test – Unit 1**

- Given,  $f(x) = x^4 - 5x^2 + 12$ . Determine the slope of the secant line on  $f(x)$  with endpoints at  $x=3$  and  $x=5$ .
- Determine the following limit **numerically**, using appropriate values of  $x$  and the table provided below.

$$\lim_{x \rightarrow 0} \frac{\tan x}{x}$$

[Make sure your calculator is in RADIAN mode!]

$x$				<b>0</b>			
$\frac{\tan x}{x}$							

- Given the graph of  $f(x)$  below, determine each of the given limits and function values.

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

b.  $\lim_{x \rightarrow -2^+} f(x) =$

c.  $\lim_{x \rightarrow -2} f(x) =$

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

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

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

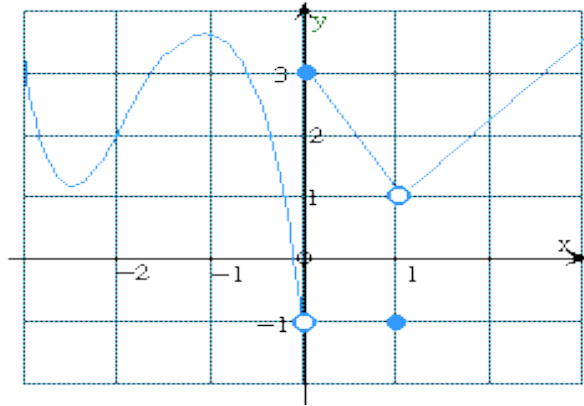
g.  $\lim_{x \rightarrow 1^-} f(x) =$

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

i.  $\lim_{x \rightarrow 1} f(x) =$

j.  $f(0) =$

k.  $f(1) =$



- For the following, determine the limits **algebraically** and show all work.

a. Find  $\lim_{x \rightarrow -3} \frac{x^2 + 5x + 6}{x^2 + 3}$

b. Find  $\lim_{x \rightarrow -4} \frac{x^2 + 3x - 4}{x^2 + 7x + 12}$

c. Find  $\lim_{x \rightarrow 25} \frac{\sqrt{x} - 5}{x - 25}$

d. Find  $\lim_{x \rightarrow 5} \frac{\frac{15}{x} - 3}{x - 5}$

e. Find  $\lim_{x \rightarrow -7^-} \sqrt{x+7}$ . Check your answer, numerically.

- Given  $f(x) = \frac{x^2 + x - 30}{x^2 - 11x + 30}$ . Determine the  $x$ -coordinates of all *holes* and/or *Vertical Asymptotes*.

- Given,  $f(x) = \begin{cases} -3x+1; & x \leq -3 \\ x^2+1; & x > -3 \end{cases}$  Use the *Limit Theorem* to determine  $\lim_{x \rightarrow -3} f(x)$ . Show all work.

- Consider  $f(x)$  defined as:  $f(x) = \begin{cases} cx+1 & ; x \leq 5 \\ cx^2-1 & ; x > 5 \end{cases}$

Use the *Continuity Theorem* to determine the value of  $c$  that would make  $f(x)$  continuous at  $x = 5$ .