

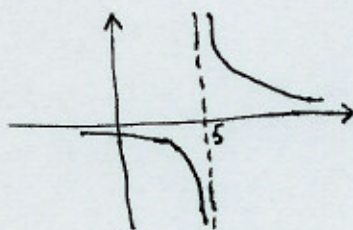
Name: Solution I.D. # \_\_\_\_\_ Section # \_\_\_\_\_ Serial # \_\_\_\_\_

1. Find each of the following limits:

$$i) \lim_{x \rightarrow 0^-} \frac{3x}{|2x|} = \lim_{x \rightarrow 0^-} \frac{3x}{-2x} = -\frac{3}{2}$$

$$ii) \lim_{k \rightarrow 1} \frac{k^3 - 1}{5k - 5} = \lim_{k \rightarrow 1} \frac{(k-1)(k^2+k+1)}{5(k-1)} = \lim_{k \rightarrow 1} \frac{k^2+k+1}{5} = \frac{3}{5}$$

$$iii) \lim_{x \rightarrow 5^-} \frac{1}{x-5} = -\infty$$

2. Find the vertical asymptote(s), if any, for the function  $y = 3 + \ln x$ 

$$\text{Since } \lim_{x \rightarrow 0^+} 3 + \ln x = -\infty \Rightarrow x = 0 \text{ is a V.A.}$$

i.e. the y-axis.

$$3. \text{ Given } g(x) = \begin{cases} x-1 & x < 0 \\ x^2 & 0 < x \leq 2 \\ 8-x & x > 2 \end{cases}$$

Evaluate each of the following limits, if it exists

$$i) \lim_{x \rightarrow 2^-} g(x) = \lim_{x \rightarrow 2^-} x^2 = 4$$

$$ii) \lim_{x \rightarrow 1} g(x) = \lim_{x \rightarrow 1} x^2 = 1$$

$$iii) \lim_{x \rightarrow 0} g(x) :$$

$$\left. \begin{array}{l} \lim_{x \rightarrow 0^+} g(x) = \lim_{x \rightarrow 0^+} x^2 = 0 \\ \lim_{x \rightarrow 0^-} g(x) = \lim_{x \rightarrow 0^-} (x-1) = -1 \end{array} \right\} \Rightarrow \lim_{x \rightarrow 0} g(x) \text{ DNE.}$$