UNIT 1

STATION II – Limits to INFINITY - (GRAPHICALLY)

~~1.0~~ Students demonstrate knowledge of both the formal definition and the graphical interpretation of limit of values of functions. This knowledge includes one-sided limits, infinite limits, and limits at infinity. ~~Students know the definition of convergence and divergence of a function as the domain variable approaches either a number or infinity:~~

1.2 Students use graphical calculators to verify and estimate limits.

LEVEL 1

Complete the following sentence.

1. In order to find the vertical asymptote of a function, I must set the _____ equal to _____.
2. If a zero in the denominator is cancelled out because it also appears in the numerator, then the graph has a _____ at that value.

LEVEL 2

Find the vertical asymptotes/holes for f where $f(x) = \frac{(3x+1)(x-7)(x+4)}{(x-7)^2(x+4)}$

Find the vertical asymptotes/holes for f where $f(x) = \frac{2x^2-5x-12}{x^2-5x+4}$.

3) $\lim_{x\to-\infty} \frac{2x^2}{x^2-4}$

4) $\lim_{x\to\infty} -\frac{3x^2}{4x+4}$

LEVEL 3

[20]. Suppose the total cost, $C(q)$, of producing a quantity q of a product equals a fixed cost of \$1000 plus \$3 times the quantity produced. So total cost in dollars is

$$C(q) = 1000 + 3q.$$

The average cost per unit quantity, $A(q)$, equals the total cost, $C(q)$, divided by the quantity produced, q. Find the limiting value of the average cost per unit as q tends to 0 from the right. In other words find

$$\lim_{q \to 0^+} A(q)$$