11 Sept 2009

75) Prove $\lim_{x \to 3^+} \frac{1}{x-3} = \infty$

Since $y = \frac{1}{x-3}$ is defined for all $x > 3$ then there exists some open interval $(3, y)$ for which f is defined,

for any $m > 0$ let $\delta = \frac{1}{m}$

when $0 < x - 3 < \delta$

$f(x) > m$

$\frac{1}{x-3} > m$

$1 > m(x-3)$

$\frac{1}{m} > x - 3$

$x - 3 < \frac{1}{m}$

$m(x-3) < 1$

$m < \frac{1}{x-3}$

$\frac{1}{x-3} > m$