nopol10 wrote on Tue, 11 November 2008 11:38Actually, lim(5/x,x,0) (Limit of 5/x as x -> 0) is not infinity as limit of 5/x as x->0 from the negative side and the limit of 5/x as x->0 from the positive side are not equal. Therefore the limit is undefined. It is infinity only when x->0 from the positive side and negative infinity when x->0 from the negative side.
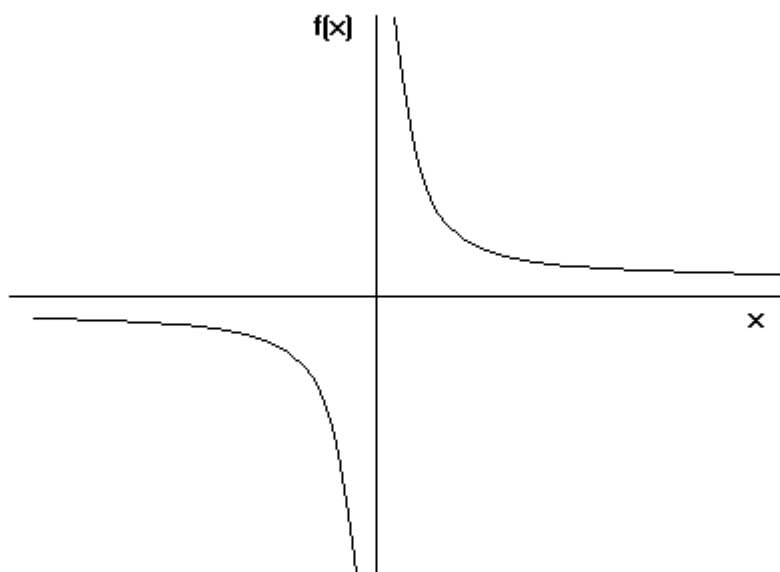
you are right. the graph of y=5/x is similar to y=1/x which is like:

so limit doesn't exist.

File Attachments
1) loverx.gif, downloaded 978 times

2) solution.JPG, downloaded 777 times

$$\lim_{x \to 0} \frac{\sin 5x}{2-2\cos x}$$

$$\lim_{x \to 0} \frac{\sin 5x}{2(1-\cos x)} \qquad \cos x = 1 - 2\sin^2(x/2)$$

$$1 - \cos x = 2\sin^2(x/2)$$

$$\lim_{x \to 0} \frac{\sin 5x}{4\sin^2(x/2)} \qquad \text{(eqn. 1)}$$

$$\lim_{x \to 0} \frac{\dfrac{5\sin 5x}{5x}}{\dfrac{\sin^2(x/2)}{(x/2)^2} \, x} \qquad \text{(when simplified, we have eqn.1)}$$

$$\lim_{x \to 0} \frac{5}{x}$$

for 0- limit is at - infinity
for 0+ limit is at +infinity   =>limit doesn't exist.