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Subject: Re: Math Question #1

Posted by [archerman](#) on Tue, 11 Nov 2008 11:08:33 GMT

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nopol10 wrote on Tue, 11 November 2008 11:38: Actually,  $\lim_{x \rightarrow 0} (5/x)$  (Limit of  $5/x$  as  $x \rightarrow 0$ ) is not infinity as limit of  $5/x$  as  $x \rightarrow 0$  from the negative side and the limit of  $5/x$  as  $x \rightarrow 0$  from the positive side are not equal. Therefore the limit is undefined. It is infinity only when  $x \rightarrow 0$  from the positive side and negative infinity when  $x \rightarrow 0$  from the negative side.

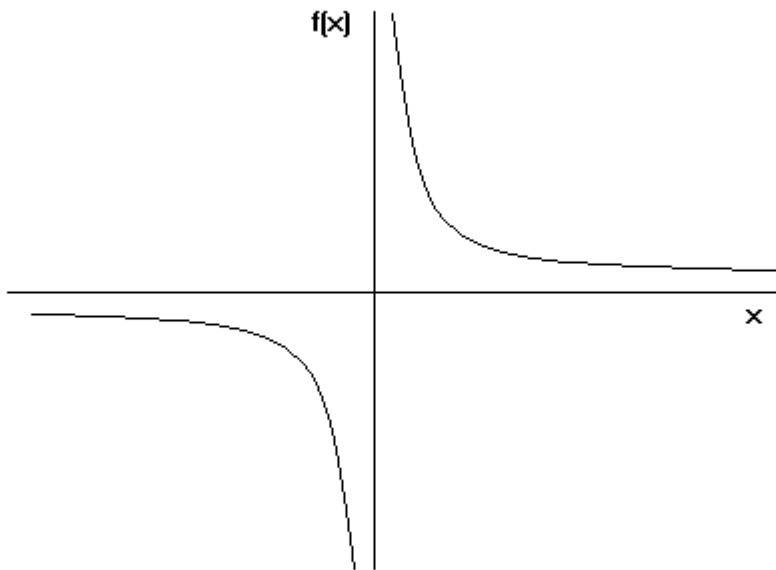
you are right. the graph of  $y=5/x$  is similar to  $y=1/x$  which is like:

so limit doesn't exist.

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### File Attachments

1) [loverx.gif](#), downloaded 1070 times



2) [solution.JPG](#), downloaded 919 times

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

$$\lim_{x \rightarrow 0} \frac{\sin 5x}{2(1-\cos x)} \quad \begin{array}{l} \cos x = 1 - 2\sin^2(x/2) \\ 1 - \cos x = 2\sin^2(x/2) \end{array}$$

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

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

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

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