

Answer on Question #76834 – Math – Calculus

Question

-The position of an object at time t is given by $s(t) = -2 - 6t$. Find the instantaneous velocity at $t = 2$ by finding the derivative.

Solution

$$v(t) = s'(t) = -6$$

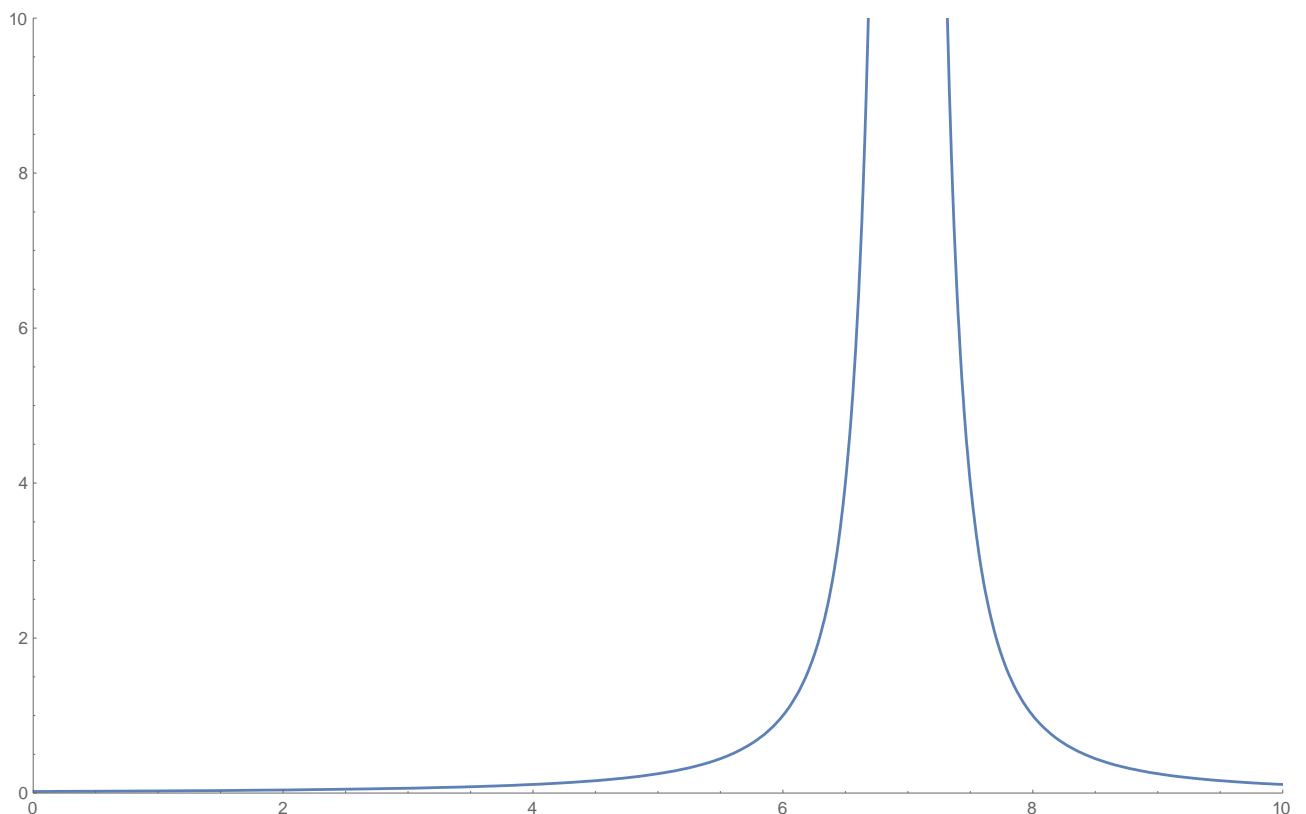
$$v(2) = -6$$

Question

-Use graphs and tables to find the limit and identify any vertical asymptotes of limit of 1 divided by the quantity x minus 7 squared as x approaches 7.

Solution

$$f(x) = \frac{1}{(x-7)^2}$$



Asymptotes can be located where denominator is equal to zero:

$$(x-7)^2=0 \Rightarrow x=7$$

x	f(x)
6.9	100
6.99	10000

6.999	1000000
6.9999	100000000
7.0001	100000000
7.001	1000000
7.01	10000

$$\lim_{x \rightarrow 7^-} \frac{1}{(x-7)^2} = \infty, \lim_{x \rightarrow 7^+} \frac{1}{(x-7)^2} = \infty$$

Thus,

$$\lim_{x \rightarrow 7} \frac{1}{(x-7)^2} = \infty \text{ and } x=7 \text{ is the vertical asymptote.}$$