Math 1A (7:30am – 8:20am)
Group Quiz 7
Wed Nov 12, 2008

Group Members' Names: _____

_____

_____

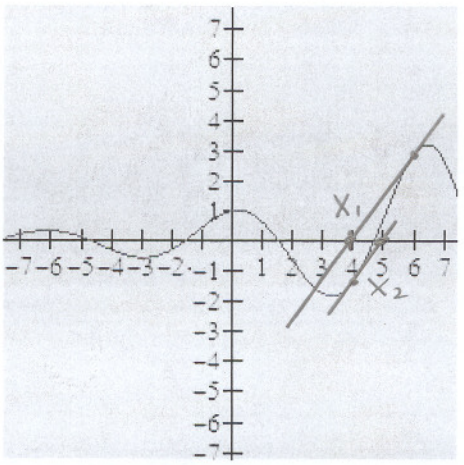
SCORE: ___ / 10 POINTS

NO CALCULATORS ALLOWED

You should probably get back to the quiz, instead of spending time looking at the interstitials.

Using Newton's method to solve $f(x) = 0$ for the function shown below, find an approximate value of x_2 if $x_0 = 6$.

SCORE: ___ / 2 POINTS



$x_1 \approx 4$

$x_2 \approx 5$

Seriously, stop looking at the interstitials.

Using Newton's method to solve $x^2 + 4 = 6x$, find the value of x_2 if $x_0 = 4$.

SCORE: ___ / 2 POINTS

You must show all relevant values that were calculated.

$x^2 - 6x + 4 = 0$ (¼)

$f(x)$

$f'(x) = 2x - 6$ (¼)

$x_0 = 4$

$x_1 = 4 - \frac{f(4)}{f'(4)} = 4 - \frac{-4}{2} = 6$ (½, ¼)

$x_2 = 6 - \frac{f(6)}{f'(6)} = 6 - \frac{4}{6} = 5\frac{1}{3}$ (½, ¼)

Why did the chicken cross the road ? She didn't – she was too busy looking at the interstitials.

Evaluate the following limits.

SCORE: ___ / 6 POINTS

[a] $\lim_{x \to 0+} \left(\frac{1}{x} - 1\right)^x$ CONSIDER $\lim_{x \to 0^+} \ln\left(\frac{1}{x} - 1\right)^x$ (½)

$= \lim_{x \to 0^+} x \ln\left(\frac{1}{x} - 1\right)$ $0 \cdot \infty$ (½)

$= \lim_{x \to 0^+} \frac{\ln\left(\frac{1}{x} - 1\right)}{\frac{1}{x}}$ $\frac{\infty}{\infty}$ (½)

$= \lim_{x \to 0^+} \frac{\frac{1}{\frac{1}{x} - 1} \cdot -\frac{1}{x^2}}{-\frac{1}{x^2}}$ $\frac{1}{\infty}$ (1)

$= 0$ (½)

so $\lim_{x \to 0^+} \left(\frac{1}{x} - 1\right)^x = e^0 = 1$ (½)

[b] $\lim_{x \to 0} \frac{x \sin x}{1 - \cos x}$ $\frac{0}{0}$

$= \lim_{x \to 0} \frac{\sin x + x \cos x}{\sin x}$ $\frac{0}{0}$ (1)

$= \lim_{x \to 0} \frac{\cos x + \cos x - x \sin x}{\cos x}$ (1)

$= \frac{2}{1}$

$= 2$ (½)

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You should probably get back to the quiz, instead of spending time looking at the interstitials.

Using Newton's method to solve $x^2 + 4 = 6x$, find the value of x_2 if $x_0 = 4$. **SCORE: ___ / 2 POINTS**

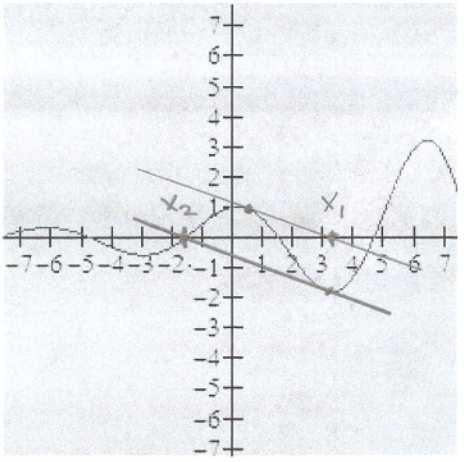
You must show all relevant values that were calculated.

SEE OTHER KEY

Seriously, stop looking at the interstitials.

Using Newton's method to solve $f(x) = 0$ for the function shown below, **SCORE: ___ / 2 POINTS**

find an approximate value of x_2 if $x_0 = 0.5$.



$x_1 \approx 3.2$

$x_2 \approx -1.6$

Why did the chicken cross the road ? She didn't – she was too busy looking at the interstitials.

Evaluate the following limits. **SCORE: ___ / 6 POINTS**

[a] $\lim_{x \to 0} \dfrac{x \sin x}{1 - \cos x}$

[b] $\lim_{x \to 0+} \left(\dfrac{1}{x} - 1 \right)^x$

SEE OTHER KEY