231 Quiz 3

February 10, 2011

Name: _____

Name: * key *

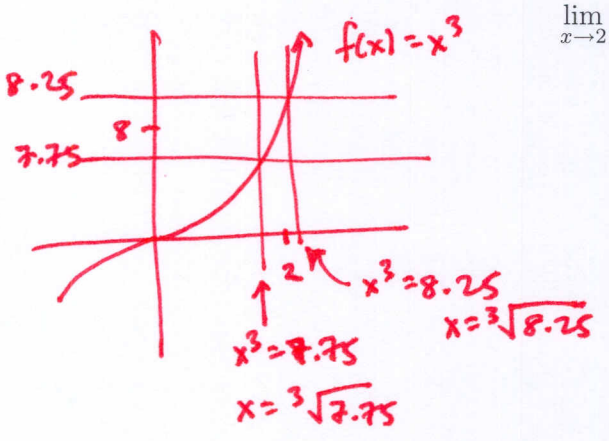
Name: _____

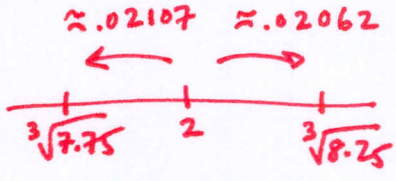
Work in groups but do NOT split up problems or tasks. You must discuss each problem as a group and agree on a final answer. Hand in one quiz per group.

You may use your hand-written Notebooks but no other materials and no technology at all. Please keep your discussions quiet so as not to disturb or inform other groups.

1. For the limit $\lim_{x\to c} f(x) = L$ below and $\epsilon = 0.25$, use graphs and algebra to approximate the largest value of δ such that $x \in (c-\delta, c) \cup (c, c+\delta)$, then $f(x) \in (L-\epsilon, L+\epsilon)$. Explain your reasoning clearly and put a box around your final answer for δ.

$\lim_{x\to 2} x^3 = 8$



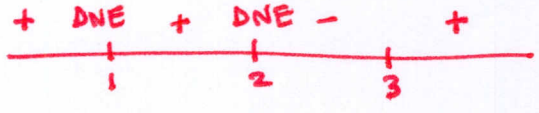


So any x within ± .02062 of 2 will work.

$\delta = \sqrt[3]{8.25} - 2 \approx .02062$

2. Solve the inequality below by using a labeled number line. Write your final answer in interval notation and put a box around it.

$$\frac{(x-3)(x-1)}{(x-2)(x-1)} = \frac{x^2-4x+3}{x^2-3x+2} \geq 0$$



$(-\infty, 1) \cup (1, 2) \cup [3, \infty)$

231 Quiz 5

February 24, 2011

Name: _____

Name: * key *

Name: _____

Work in groups but do not split up problems or tasks. You must discuss each problem as a group and agree on a final answer. Hand in one quiz per group.

You may use your hand-written Notebooks but no other materials and no technology at all. Please keep your discussions quiet so as not to disturb or inform other groups.

1. Calculate the following limits. You must justify your answers with algebraic calculations and show your work clearly and in order if you want full credit.

a) $\lim_{x\to 0^+} \dfrac{x+\sqrt{x}}{\sqrt{x}}$ $\longrightarrow \dfrac{0}{0}$ ind.

6 pts

$= \lim_{x\to 0^+} \dfrac{\sqrt{x}(\sqrt{x}+1)}{\sqrt{x}} = \lim_{x\to 0^+} (\sqrt{x}+1) = \sqrt{0}+1 = \boxed{1}$.

b) $\lim_{x\to\infty} \dfrac{1-3x^2}{(x-1)(2x+1)}$ $\longrightarrow \dfrac{-\infty}{\infty}$ ind.

6 pts

$= \lim_{x\to\infty} \dfrac{1-3x^2}{2x^2-x-1} \dfrac{(1/x^2)}{(1/x^2)} = \lim_{x\to\infty} \dfrac{1/x^2 - 3}{2 - 1/x - 1/x^2} = \dfrac{0-3}{2-0-0} = \boxed{\dfrac{-3}{2}}$.

c) $\lim_{x\to 1} \dfrac{\frac{1}{x}-1}{x-1}$ $\longrightarrow \dfrac{1-1}{1-1} = \dfrac{0}{0}$ ind.

6 pts

$= \lim_{x\to 1} \dfrac{\left(\frac{1-x}{x}\right)}{x-1} = \lim_{x\to 1} \dfrac{(1-x)^{-1}}{x(x-1)} = \lim_{x\to 1} \dfrac{-1}{x} = \dfrac{-1}{1} = \boxed{-1}$.

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