MATH 131
Quiz ~~IX~~ II
September 22, 1993

Name _____ allow 30 (25 - 25 would be OK) →

$\bar{x}$ 21.9/30
m = 23.5 started to learn after 17 (checking at 15)
Lots at 19 + 20, 25
mod time = ~~23~~

(5) 1. Complete the following definition: The Derivative of the function f is defined by

$f'(x) =$

13 all most left of line

odd layout line problem?

(18) 2. Find the following limits

a. $\lim_{x \to 2^+} \frac{x-3}{x-2}$ $\frac{-1}{0+}$ some used calc $= -\infty$ both 6 right

b. $\lim_{x \to \infty} \frac{3x^2 - 7x}{x^2 + 8} = \lim_{x \to \infty} \frac{3 - \frac{7}{x}}{1 + \frac{8}{x^2}} = 3$ 15 all or nothing

(14) 3. Use formulas to compute the derivative for each: many did too much alg

a. $f(x) = x^{17} - 3x^4 + 2x^2 - 7$, find f''

$f'(x) = 17x^{16} - 12x^3 + 4x$

$f''(x) = 17(16)x^{15} - 36x^2 + 4$

all but 4 all close 2 f'

17 / 16 / 272 / 17 / 272

b. $f(x) = (x^2 - x + 20)(x^5 + 4x^3 - x + 17)$

$f'(x) = (x^2 - x + 20)(5x^4 + 12x^2 - 1) + (x^5 + 4x^3 - x + 17)(2x - 1)$ 24

c. $y = \frac{x^2 - 8}{x^3 + 7x}$ $\frac{dy}{dx} = \frac{(x^3 + 7x)(2x) - (x^2 - 8)(3x^2 + 7)}{(x^3 + 7x)^2}$ 20 all 3

1 error
odd one with neg up

7 all

(5) 4. Using only the *definition*, find f'(x) when $f(x) = \sqrt{x+2}$ Did me like this (harder) right before Quiz.

$$\frac{f(x+h) - f(x)}{h} = \frac{\sqrt{(x+h)+2} - \sqrt{x+2}}{h} \cdot \frac{\sqrt{x+h+2} + \sqrt{x+2}}{\sqrt{\quad} + \sqrt{\quad}}$$

$$= \frac{x+h+2 - (x+2)}{h(\sqrt{x+h+2} + \sqrt{x+2})} \quad \text{(} -x-2 \text{)} = \frac{h}{h(\sqrt{\quad} + \sqrt{\quad})}$$

$$= \frac{1}{\sqrt{x+h+2} + \sqrt{x+2}} \to \frac{1}{\sqrt{x+2} + \sqrt{x+2}}$$

$$= \frac{1}{2\sqrt{x+2}}$$