MATH 131
Quiz 4
October 3, 1997

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Name Key

attend 25m
First left @ 8
15 16 16 16 18 18 19 20 20 21 (21 22)
23 24 25 23 26 28 x x x x

$\bar{x} = 253/30$

$m = 27$

1. Find the following derivatives: Do NOT simplify!

a. $f(x) = (x^3 - 3x^2 + 8)^{10}$,

$f'(x) = 10(x^3-3x^2+8)^9(3x^2-6x)$ ✓

all but 3

b. $y = \frac{1}{x^3+1}$, $= (x^3+1)^{-1}$

$\frac{dy}{dx} = \frac{(x^3+1)\cdot 0 - 1(3x^2)}{(x^3+1)^2}$ or $(-1)(x^3+1)^{-2}(3x^2)$

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

all but 1

c. $f(x) = \sqrt{5x+3} = (5x+3)^{1/2}$

$f'(x) = \frac{1}{2}(5x+3)^{-1/2}(5)$

4pm, 5

all but 1

d. $y = \left[(x^2-3)^8 + 3x\right]^6$

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$\frac{dy}{dx} = 6\left[(x^2-3)^8+3x\right]^5\left[8(x^2-3)^7 \cdot 2x + 3\right]$

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e. $f(x) = (x^2+2x+5)^5(3x-8)^6$

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$f'(x) = (x^2+2x+5)^5\left(6(3x-8)^5\cdot 3\right) + (3x-8)^6\left(5(x^2+2x+5)^4(2x+2)\right)$

all but 1

~~5 $(x^2+2x+5)^5\, 6(3x-8)^5\cdot 3$ +~~

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2. If the edge of a square is increasing at the rate of 3 cm per minute when the edge is 120 cm, at what rate is the area changing?

$A = x^2$ $\quad \frac{dA}{dx} = 2x$

$\frac{dx}{dt} = 3$ when $x = 120$

$\frac{dA}{dt} = \frac{dA}{dx}\cdot\frac{dx}{dt} = 2x\frac{dx}{dt} = 2(120)(3) = 720\ cm^2/min$

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3. Find the maximum and minimum values for $f(x) = x^3 + 2x^2$ on $[-.5, 2]$. Show work!

$f'(x) = 3x^2+4x = 0$

$3x(3x+4) = 0$

$x = 0 \quad x = -\frac{4}{3}$

x	y
-.5	~~.95~~ ~~.75~~ .375
$-\frac{4}{3}$	1.18
0	0
2	16

MAX 16
MIN 0

graph looks nice! good!

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must show