Math 1271 - Lectures 010 and 030
Fall 2017
Quiz 8C
11/07/17
Time Limit: 25 Minutes

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You may *not* use your books, notes, graphing calculator, phones or any other internet devices on this exam.

You are required to show your work on each problem on this quiz.

Problem	Points	Score
1	3	1.5
2	4	1
3	3	1
Total:	10	3.5

1. (3 points) Starting with the initial guess $x_1 = -2$, use Newton's method to approximate a root to the equation $e^x + x^2 - 3 = 0$ to eight decimal places.

+1.5

$$X_{n+1} = X_n - \frac{f(X_n)}{f'(X_n)} \qquad f'(x) = e^x + 2x$$

$$x_2 = -2 - \frac{e^{-2} + (-2)^2 - 3}{e^{-2} + 2(-2)}$$

$\boxed{x_2 = -1.70622671}$

$x_3 = -1.97129004$

$x_4 = -1.73042866$

$x_5 = -1.9477436$

$x_6 = -1.75051225$

$x_7 = -1.92847961$

$x_8 = -1.76710862$

$x_9 = -1.91273715$

$x_{10} = -1.78078217$

$x_{11} = -1.89988634$

$x_{12} = -1.792023337$

(I'm more just intrigued than calling you out)

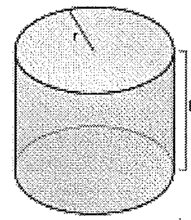
... I earnestly have no idea how you got those numbers & usually I can tell. I imagine calculation errors, but the fact it keeps jumping between two values is fascinating

2. (4 points) If 600π cm^2 material is available to make a cylinder with an open top, find the largest possible volume of the cylinder.
Hint: The surface area of a cylinder with an open top is $\pi r^2 + 2\pi r h$, where r is the base radius, h is the height.

$SA = \pi r^2 + 2\pi r h$

$SA = 600\pi \text{ cm}^2$

$600\pi \text{ cm}^2 = \pi r^2 + 2\pi r h$



$\frac{ds}{dt} = 2\pi r \cdot r' + 2\pi r' \cdot h'$

+1

3. (3 points) Show that the curve $y = \sqrt{x^2+5} + 2x$ has one slant asymptote at $y = 3x$ and one horizontal asymptote at $y = 0$.

$\lim_{x \to \infty} \sqrt{x^2+5} + 2x$

$\lim_{x \to \infty} (f(x) - mx + b)$

$\lim_{x \to \infty} (\sqrt{x^2+5} + 2x - (3x))$

$y = \sqrt{0^2+5} + 2(0)$ +1

$y = \sqrt{5} = \text{y-int}$

$0 = \sqrt{x^2+5} + 2x$

$0 =$