

Test #1 (Part 2 – Calculator Okay)

Math 180, Prof. Beydler

Name: _____

Wednesday, September 26, 2018

Directions: Show all work. No books or notes. A **scientific calculator** is allowed. Your desk and lap must be clear (no phones, no smart watches, etc.). If you have a phone in your lap or on your chair, it is considered cheating, and you will receive a zero on this test. Write your answers in the indicated places, or box your answers. Good luck!

1. Find the following limits.

a) (2 points) $\lim_{x \rightarrow 2} \frac{3x^2 - 5x - 2}{x^2 + 7x - 18}$

Answer: _____

b) (2 points) $\lim_{x \rightarrow 2^-} \frac{x^2 - 2x - 6}{x - 2}$

Answer: _____

c) (2 points) $\lim_{x \rightarrow \infty} \frac{\sqrt{4x^2 + 3x - 1}}{3x + 2}$

Answer: _____

d) (2 points) $\lim_{x \rightarrow 1^+} 2^{\ln(x-1)}$

Answer: _____

e) (2 points) $\lim_{x \rightarrow -\infty} (\sqrt{x^2 + 1} + x)$ (Be sure to explain your reasoning for full credit here!)

Answer: _____

2. (2 points) Find the value of c such that $f(x) = \begin{cases} 2 + \sqrt{x} & \text{if } 0 \leq x \leq 1 \\ \ln cx & \text{if } x > 1 \end{cases}$ is continuous on $[0, \infty)$

$c =$ _____

3. (3 points) Use the Intermediate Value Theorem to show that there is a root of $3 - 2x = e^x$ in the interval $(0, 1)$.

4. (4 points) Find the derivative of $f(x) = \frac{2}{x-1}$ using the limit definition.

Answer: _____

5. (3 points) Find an equation for the tangent line to $y = (5x^2 + 2)e^x$ at the point $(0, 2)$.

Answer: _____

6. (2 points) Find the second derivative of $y = \tan 3x$.

Answer: _____

Note: Be sure to double check your work. And remember to turn in your homework and extra credit! 😊