

Math 162 Exam 1 Skills Check

Name:

Instructions: The purpose of this exercise is to test your knowledge and skills with regard to the basic concepts that the exam problems will be based on. You should use this as a guide to identify where you are weak, strong, or could use some improvement on basic skills. The actual exam will be based on level 1, 2 and mixed review problems as well as examples from lecture. Show your work as clearly as possible because you will be graded on your use of notation and clarity as well as your work.

1. Determine the domain of $f(x) = \sqrt{2-x} + \sqrt{x+7}$

2. Evaluate the limit or explain why it does not exist.

(a)

$$\lim_{x \rightarrow -2} \frac{x+1}{x+2}$$

(b)

$$\lim_{h \rightarrow 0} \frac{\sqrt{16+h} - 4}{h}$$

3. Let $f(x) = \frac{3}{x}$. State the limit definition of the derivative (there are two, you can choose which one) and use it to find $f'(x)$. Determine the equation of the normal line to the graph of f if $x = 3$.

4. Sketch a graph of $y = -3 \cos t$ over one full period. Label all intercepts and key points.

(a) What is the instantaneous rate of change of y if $t = 5\pi/6$?

(b) For what values of t in the interval $[0, 2\pi)$ is the tangent line to the graph horizontal?

5. Sketch a graph of $g(x) = 4e^{-x}$. Compute the derivative of g and the equation of the tangent line at $x = 0$. Sketch the tangent line with the graph of g .

6. Compute the derivatives of the following functions:

(a) $f(x) = \frac{A+Bx^3}{\tan x}$, for A, B positive real numbers.

(b) $y = 6e^{-x^2} \cdot \sin(3x)$

7. On a scale of 1-5 (5 being the best performance) how do you feel you did on this assessment? Please explain.