

Name:

Math 115 Exam 2

October 27, 2022

1. WRITE YOUR NAME ON THIS TEST!
2. Except where indicated, merely finding the answer to a problem is not enough to receive full credit; you must show how you arrived at that answer.
3. Unless indicated, DO NOT convert irrational numbers such as $\sqrt{3}$ or π into decimal approximations; just leave them as they are.
4. If you have a question, raise your hand or come up and ask me.

1) Find the derivatives of the following functions:

a) $f(x) = \cos(x) \cdot (8x^5 - 4x^2 + 9x + e^2)$

b) $g(x) = \frac{e^x}{17x^3 - 12x^2}$

c) $h(x) = \sin(\sqrt{\ln(x^4)})$

2) Compute the equation of the tangent line to the graph of

$$\tan(\pi x^2 y^6) - \ln(xy^2) = 1$$

at the point $(4, 1/2)$.

3) Determine the equation of the tangent plane to the graph of the function

$$z = f(x, y) = e^{x^2y - y^3x}$$

at the point $(4, 2, 1)$.

4) Determine the values of the following limits:

a) $\lim_{x \rightarrow 0} \frac{1 - \cos^2(3x)}{16x^2}$

b) $\lim_{x \rightarrow 4} \frac{\ln(\tan^2(\frac{4\pi}{3x})) - \ln(3)}{2x^2 - 3x - 20}$