MATH 106 CALCULUS I FOR BIO. & SOC. SCI. FALL 2012

INSTRUCTOR: NITU KITCHLOO

Homework 8.

Please show all your work.

(1) What is the largest area for a right angle triangle whose hypotenuse is 10 cm long?

(2) Find the dimensions of a right circular cylinder that is open on the top, is closed on the bottom, has volume 100 cm^3, and uses the least amount of material.

(3) Find the point on the curve $y = \frac{1}{x}$ with $x > 0$ that is closest to $(0, 0)$.

(4) Use L'Hospital's rule to evaluate the following limits.

(a)
$$\lim_{x \to 1} \frac{x^4 - 1}{x^5 - 1}$$

(b)
$$\lim_{x \to \infty} \frac{\ln(x)}{2\sqrt{x}}$$

(c)
$$\lim_{x \to \infty} \frac{x}{e^x}$$

(d)
$$\lim_{x \to 0} \frac{e^x - 1}{\sin(x)}$$