MATH 2130 Test 3 March 22, 2012 (Winter) 60 minutes

Values

8 1. (a) What is the value of the constant C in order that the point $(1,1,1)$ be on the curve

$$x^3y^3 + xy = 2, \qquad 3x + 2y - Cz = 1?$$

(b) Find a unit tangent vector to the curve at the point $(1,1,1)$.

12 2. Evaluate the double iterated integral

$$\int_{-2}^{0}\int_{-4}^{2x} x\sqrt{x^2+y^2}\,dy\,dx.$$

20 3. Find the maximum value of the function

$$f(x,y) = xy(2-x-y)$$

on the region $x+y \le 1, \quad x \ge 0, \quad y \ge 0.$

Answers by Dawit

1. a) 4 b) $\langle \frac{4}{\sqrt{33}}, \frac{-4}{\sqrt{33}}, \frac{1}{\sqrt{33}} \rangle$ or $\langle \frac{-4}{\sqrt{33}}, \frac{4}{\sqrt{33}}, \frac{-1}{\sqrt{33}} \rangle$

2. $\frac{8}{3}(8-5\sqrt{5})$ 3. $\frac{1}{4}$