

**Quiz 6: A chance at redemption** MATH 261, CALCULUS III, SPRING 2018

CLASS TIME:

NAME:

**Instructions:** Solve as many of these problems as you can. Circle the correct answer, and show your work!

**Problem 1.** Evaluate the limit

$$\lim_{(x,y) \rightarrow (0,0)} \frac{x^2 y}{x^2 + y^2}$$

- (a) 0
- (b) 2
- (c) 1
- (d) Does not exist
- (e)  $\infty$ .

**Problem 2.** Approximate the number  $\sqrt{(3.2)^2 + (3.9)^2}$  by using a linear approximation to the function  $f(x, y) = \sqrt{x^2 + y^2}$ . Hint: think briefly about how one could work backwards to solve this problem.

- (a) 5.02
- (b) 4.96
- (c) 5.04
- (d) 5.06
- (e) 4.92.

**Problem 3** The value of  $c$  so that the two lines

$$L_1 : \frac{x-1}{2} = y+3 = \frac{z+1}{4}$$
$$L_2 : x = 1+t, \quad y = -t \quad z = 1+ct$$

intersect is

- (a) 0
- (b) -1
- (c) 1/2
- (d) -2/3
- (e) 1

**Problem 4** The values of  $a$  and  $b$  such that the line

$$x = 1 + at, \quad y = bt, \quad z = 5t$$

is the line of intersection of the planes

$$x + 2y - z = 1, \quad 2x - y + z = 2$$

are

(a)  $a = 1, b = 0$

(b)  $a = -1, b = 3$

(c)  $a = -1, b = 2$

(d)  $a = 0, b = 1$

(e)  $a = 1, b = 1$ .

**Problem 5** Find an equation of the tangent plane to the surface  $z = x^2 - y^3$  at the point  $(2, 1, 3)$ .

(a)  $4x - 3y - z = 2$

(b)  $2x - 3y + z = 1$

(c)  $x - y - 8z = -11$

(d)  $2x + y + z = 9$

(e)  $x - 3y + 2z = 5$ .