

**Quiz #12****Name:** \_\_\_\_\_**StudentID:** \_\_\_\_\_**Major:** \_\_\_\_\_**Time:** 20 minutes.

Justify your solutions and show all your steps. Write down formulae used. Make sure to look on the back side of this sheet.

1. Evaluate the integral:

$$\int_1^{\infty} \frac{1}{x^6}.$$

2. Give the domain of the function:

$$z = \frac{1}{x - y}.$$

3. Find  $\frac{\partial f}{\partial x}$  and  $\frac{\partial f}{\partial y}$  for  $f(x, y) = x^2 + xy + y^2$ .

4. If  $z = xy^3 + x^2y^2$  find  $\frac{\partial}{\partial x} \frac{\partial z}{\partial y}$  and  $\frac{\partial}{\partial y} \frac{\partial z}{\partial x}$ .