

ECO 244: Applied Mathematics II

BONUS QUIZ 1

Differentiate the following functions:

1.  $y = x^2 + 2x - \frac{3}{x}$

2.  $y = (3x^5 - 9x) \left( 2\sqrt[4]{x} - \frac{5}{x^4} \right)$

3.  $y = \frac{(5x+8x^3)}{\left(\frac{6}{\sqrt{x}}\right)}$

4. Suppose  $z = f(y) = 7y - 2y^3$  where  $y = g(x) = x^{-5}$ . Find  $\frac{dz}{dx}$

5.  $y = \left(-6x - \frac{9}{x}\right)^{-2}$

Find  $\frac{\partial z}{\partial x}$  and  $\frac{\partial z}{\partial y}$  for the following:

1.  $z = 4x^2 + 3xy + 6y^2$

2.  $z = x^4 + 8xy + 3y^3$

Find the total differential of the function  $z = f(x, y)$

1.  $z = 7x^3 - 5xy^2 + 6x - 3y$

2.  $z = 7x^2y^3$