MATHEMATICS FOR ECONOMISTS I (20201)

FINAL EXAM

1) (15P each) Find the derivatives of the following functions:

   a) $f(x) = \sqrt[3]{x^4 - 3x^2}$

   b) $f(x) = \frac{5x}{3x^2 - x}$

2) (10P each)Evaluate the following limits:

   a) $\lim_{(x,y)\to(2,-1)} \frac{x-\sqrt{y+5}}{(x+1)(x^2-y-5)}$

   b) $\lim_{(x,y)\to(0,0)} \frac{x^2y}{5x^3+xy^2}$

   c) $\lim_{(x,y)\to(1,2)} \frac{x}{2y+5x}$

3) (20P) Calculate $\partial f/\partial r$ and $\partial f/\partial s$ if

   $f(x,y) = xsiny + 5x^2y^2$ and $x = rs^2$ and $y = r^3s$.

4) (20P) Suppose z is a function of x and y and

$$3xz + z^2y = xy + 1$$

   Find $\partial z/\partial x$ and $\partial z/\partial y$