

Mathematics in Economics
Written Exam – Part 1 – 30 points

Name:

1) Find the derivatives:

a) $y = x^5 + 4x^3 - 5x + \sin x$

b) $y = \frac{3x+5}{\ln x}$

c) $y = \ln(x^3 + 2x + 1)$

6 points

2) Find the domain of the function of two variables:

$f(x, y) = \ln(x - y + 3)$

6 points

3) Find Taylor series of $f(x) = 4x^3 + 2x^2 - 5x + 1$ at the point $a = 2$.

6 points

4) Find maxima/minima of the function: $y = x^3 - 12x + 4$.

6 points

5) Find the increment (find total differential) of the function $f(x, y) = 3xy + 2x^2 - 3y^2$ for $x = 1, y = 2, dx = 0.1$ and $dy = 0.2$.

6 points