Instructions. Show all work, with clear logical steps. No work or hard-to-follow work will lose points.

Problem 1. (6 points) For the given function and values of z

$$f(x,y) = \ln\left(y - e^{5x}\right), \quad z = 0, \ln 10,$$

(a) What is the domain of this function?

(b) What type of function describes the level curves?

(c) Give a sketch of the level curves.

(d) What functions $y = f(x)$ do you get for these values of z?

Problem 2. (2 points) What is the domain of the following function?

$$f(x,y) = \ln\left(x^2 + y^2\right)$$

Problem 3. (2 points) Which lesson numbers will be relevant for our exam over lessons 13 through 19?