Quiz 3

MA 262
Artur's Class

2014/09/11

Problem 1

Suppose you are given the equation

$$dy/dx = k(Z - y),$$

where k and Z are constants.

(a) Find the general solution. (Hint: It should have 3 unknown constants in it.)

(b) If we are given that $Z = 20$ and the initial conditions $y(0) = 10$, $y'(0) = 5$ find the constant k. (Hint: you don't need part (a) for this.)

Problem 2

Suppose you are given the differential

$$\omega = (2xy + \cos x)\ dx + x^2\ dy.$$

Is ω exact? (Show me that you know what this means by labeling things in a meaninful way and doing a computation.) If it is exact, recover the potential $\phi = \phi(x, y)$. Clearly indicate your answers.