

TMATH 125 Quiz 4

Show *all* your work (numerically, algebraically, or geometrically) for each and simplify. No credit is given without supporting work.

1. [2] (§9.1 #12) Identify which function could be a solution to the differential equation $\frac{dy}{dx} = \log_2(x^2 + y^2)$. Briefly *justify* your choice.

2. [4] (sep dif eq wks #2) Find the solution of the differential equation that satisfies the given initial condition:

$$\frac{dy}{dt} = .00202y(3000 - y) \qquad y(0) = 2$$

3. [4] (WebHW13 #7) A vat with 200 gallons of beer contains 4% alcohol (by volume). Beer with 6% alcohol is pumped into the vat at a rate of 2 gal/min and the mixture is pumped out at the same rate. Let $A(t)$ be the amount of alcohol in the vat at time t and set up a differential equation modeling the described situation. Do *not* solve the differential equation, but do justify the differential equation you set up.