Quiz 2 Form A
Sept 15, 2016

[10] 1i. Suppose \$75 is invested at an annual rate of return r compounded continuously. State the initial value problem describing the amount of money after t years.

Differential equation: $y' = ry$ 3 points

Initial Value: $y(0) = 75$ 2 points

1ii. Circle the general solution to the differential equation in problem 1:

D.) $y = Ce^{rt}$ 3 points

1iii. Circle the solution to the initial value problem in problem 1:

D.) $y = 75e^{rt}$ 2 points

[10] 2.) Suppose water containing 3 lbs of salt per gallon enters and leaves a tank at a rate of 8 gallons/hour. Suppose the tank originally contains 7 lbs of salt in 500 gallons of water. State the initial value problem describing the amount of salt in the tank at time t. Do NOT solve.

Differential equation: $Q' = 24 - \frac{8Q}{500}$ *or* $Q' = 24 - \frac{2Q}{125}$ 7 points

Initial Value: $Q(0) = 7$ 3 points

Let $Q(t)$ = amount of salt (in pounds) in the tanke at time t.

$\frac{dQ}{dt}$ = Rate in - rate out = $(\frac{3lbs}{1gallon})(\frac{8gallons}{1hour}) - (\frac{Q(t)lbs}{500gallon})(\frac{8gallons}{1hour})$

$Q' = 24 - \frac{8Q}{500} = 24 - \frac{4Q}{250} = 24 - \frac{2Q}{125}$