

MA 238-02
§1.3,1.5

Quiz #2

score

Name: _____

5 February 1999

1. Find the general solution to the given differential equation. Explain what happens to the solutions as t gets large. Then find the particular solution with the property $y(0) = 1$. (7 points)

$$\frac{dy}{dt} = -2ty - 4t$$

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2. We begin with 10 kg of a radioactive material that decays according to the model in §1.5 (the rate of decay is proportional to the amount of radioactive material present). Our descendants note that there are 8 kg remaining after 1000 years. In how many years from now will there be 6 kg of radioactive material remaining?

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3. A ball is released from rest from a height of 200 feet above the ground. Some time later, a second ball is thrown downward at an initial rate of 20 feet/second. The two balls strike the ground at the same time. How much later was the second ball released than the first? Disregard the effect of air resistance in this solution and explain clearly what you are doing. If air resistance is taken into account, how do you think that would change your answer? Would it make it larger, smaller, or the same? Explain. (7 points)