

Calculus Worksheet #7 Unit 12 page 1 _____

Solve each of the following problems. Show your complete solution neatly organized.

1. The rotation of a flywheel is opposed by a frictional force which produces a negative acceleration that is proportional to the velocity. If a wheel slows from 1200 r.p.m. to 900 r.p.m. in 3 minutes, then how fast will it be turning after another 3 minutes?

2. Suppose in problem 1 that the acceleration is proportional to the square of the velocity. Answer the same question.

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Solve the following problem. Show your complete solution neatly organized.

3. A condenser discharges through a resistance at a rate that is proportional to the charge remaining. Express the charge Q at time t in terms of t , if $Q = Q_0$ when $t = 0$.

4. A tank contains 50 gallon of a salt solution which has 40 pounds of dissolved salt. Pure water runs into the tank at a constant rate of 1 gallon per minute, the concentration is kept uniform by stirring, and the mixture runs out at the same rate as the water runs in. How much salt is left in the tank in 30 minutes?