

YOUR NAME: _____

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Read each problem **very carefully** before starting to solve it. Each problem is worth 5 points. It is necessary to show **all** your work. Correct answers without explanations are worth 0 points. GOOD LUCK!!

1. A mice population tends to increase at a rate proportional to its current population p with growth rate $r = 5 \text{ week}^{-1}$. However, the presence of a predator tends to diminish the population with a constant attrition rate of $k = 12 \text{ mice/week}$. Suppose that, initially, there are 20 mice in the population.
 - (a) Write an initial value problem that reflects the given conditions with time t as the independent variable and the population $p = p(t)$ as the dependent variable.
 - (b) Obtain the general solution by solving the differential equation.
 - (c) Use the initial condition to find a particular solution giving the mice population $p(t)$ at time t .