

Each problem is worth 5 points. For full credit provide proper justification for your answer.

1. Find a solution to the differential equation $\frac{dm}{dt} = 100 - 0.3m$ subject to the initial condition that $m(0) = 400$.

2. Lake Superior has a volume of approximately 12.2 thousand km^3 , and an outflow rate of roughly 65.2 km^3 per year. Write a differential equation that models the quantity Q of some pollutant in the lake over time.