# Math 2080: Differential Equations
# Worksheet 2.2: Initial value problems

**NAME:**

1. Suppose that \$100 is invested at a rate of 5%, compounded continuously. Set up and solve an initial value problem (IVP) that models this, and determine how long it takes for the investment to grow to \$500.

2. Tritium is an isotope of hydrogen that can be used as a biochemical tracer. Suppose that 10 mg of tritium decays to 8 mg in 4 hours. Determine its half-life.

3. A murder victim is discovered at midnight and the temperature of the body is recorded at 31°C. One hour later, the temperature of the body is 29°C. Assume that the ambient air temperature is a constant at 21°C. Use Newtons law of cooling [the differential equation $T' = k(A - T)$] to calculate the victims time of death (when his body temperature was 37°C).