

Review 6.4 to 6.6

1. Suppose the decay equation for a radioactive element is known to be $y = y_0 e^{-0.4t}$, with t in years. About how long will it take for a sample of this element to decay to 45% of its original amount?
2. The temperature of an egg was 160° at the instant it was removed from the boiling water. After 5 minutes, its temperature is 120° . If room temperature is 65° , how much longer will it take for the egg to cool to 80° ?
3. The current population of a town is $P(0)=150,000$ and the relative growth rate is 7.2%. Assuming the growth rate remains constant, what will the population be after 10 years?
4. Suppose the improved Euler's method is used to solve the initial value problem $y' = y + \cos x$, $y(0)=1$, starting at $x_0=0$ with $dx=.2$. What value is obtained for $y(3)$?
5. Use Euler's method to solve the initial value problem graphically starting at $x_0=0$ with $dx=.25$. $y' = 0.4y + 2x$, $y(0) = 2.5$