

MAPLE PROJECT 1
Due date February 8, 2008

Problem 1. Find the value of k ($k > 1$) such that the region enclosed by $y = \frac{1}{2} \ln x$, $y = 0$, and $x = k$ has an area of 4 square units.

Problem 2. Let $f(x) = 2 + 3^{-x}$, $g(x) = 2^x$.

- (a) Plot the two functions on the same coordinate system and estimate the point of intersection.
- (b) Use appropriate command to find the point of intersection of the two functions and verify your answer.

Problem 3. Let assume that a rumor spreads according to the following equation

$$p(t) = \frac{2}{2 + a e^{-kt}}.$$

Where $p(t)$ is the ratio of the population that knows the rumor at time t and a and k are positive constants.

- (i) Find the rate of the spread of the rumor.
- (ii) Graph p for the case $a = 8$, $k = .5$ with t measures in hours. Estimate how long it will take for 80% of the population to hear the rumor.