

Home work 1. (Due September 17, 2008)
Math 353 Section 12, Fall 2008, University of Delaware

MatLab Exercises

1. Draw graphs of the functions $y_1(x) = \sin x$ and $y_2 = \cos(2x)$ for $0 \leq x \leq 2$ on the same window (check the help for **plot** and use it). Use the zoom facility to determine the point of intersection of the two curves to three significant decimal places.
2. Use the MatLab and estimate the following limits.

(a)

$$\lim_{n \rightarrow \infty} \left(1 + \frac{1}{n}\right)^n$$

(b)

$$\lim_{x \rightarrow 0} \frac{\sin x}{x}$$

3. Draw graphs of the functions

$$y_1(x) = e^x, \quad y_2(x) = \sqrt{x}, \quad y_3(x) = \ln x, \quad y_4(x) = \tan x$$

for $1 \leq x \leq 2$ (check the help for **subplot** and use it).

4. Write a function-file that will simulate n throws of three dice (check help for **rand** and **floor**).
5. The *Fibonacci* sequence is defined, $f_1 = 0$, $f_2 = 1$ and

$$f_n = f_{n-1} + f_{n-2}, \quad n = 3, 4, 5, \dots$$

Write a function-file that will compute the n th number in the *Fibonacci* sequence and use it to estimate

$$\lim_{n \rightarrow \infty} \frac{f_{n-1}}{f_n}.$$

Exercises

1. Exercise 0.3.2.
2. Find the absolute error and relative error of the following approximations. Also determine the number of significant digits in the approximation.
 - (a) $x = 2.718281828$ and $x_A = 2.7182$
 - (b) $w = 98.350$ and $w_A = 98$
 - (c) $y = 0.000068$ and $y_A = 0.00006$