



정보통신 수학 및 실습

3월 3주차 Lab assignment



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Chapter 1. Lab Assignment

1. Solve the following problems using MATLAB when:

$$f(x) = 5x^2 - 3x + 1$$

$$f = [5, -3, 1]$$

a) Evaluate $f(x)$ for $x = -1, 0, 1$

$$x = [-1:1]$$

$$\text{polyval}(f, x)$$

$$\text{ans} =$$

$$9 \ 1 \ 3$$

b) Find the roots of $f(x)$

$$\text{roots}(f)$$

$$\text{ans} =$$

$$0.30000 + 0.33166i \quad 0.30000 - 0.33166i$$

c) Factorize the $f(x)$ using (b)

$$5(x - (0.3 + 0.33166i))(x - (0.3 - 0.33166i))$$

d) Express x whose values are between -1 and 1 and stepping interval of 0.1.

$$x = [-1:0.1:1]$$

e) Evaluate $f(x)$ for the x values defined in (d).

$$y = \text{polyval}(f, x)$$

$$\text{ans} =$$

Columns 1 through 10:

$$9.00000 \ 7.75000 \ 6.60000 \ 5.55000 \ 4.60000 \ 3.75000 \ 3.00000 \ 2.35000 \ 1.80000 \ 1.35000$$

Columns 11 through 20:

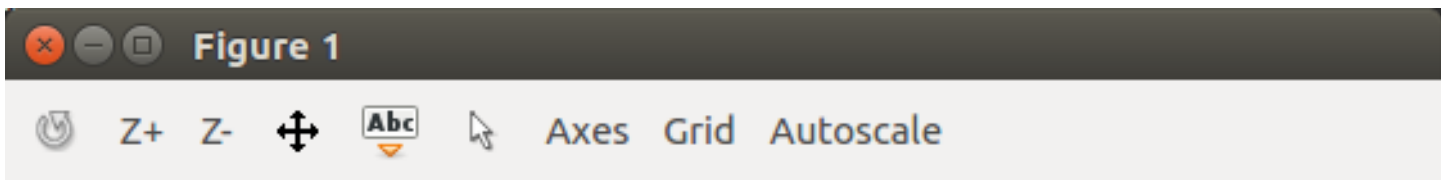
$$1.00000 \ 0.75000 \ 0.60000 \ 0.55000 \ 0.60000 \ 0.75000 \ 1.00000 \ 1.35000 \ 1.80000 \ 2.35000$$

Column 21:

$$3.00000$$

f) Plot $f(x)$ in (e). Label the x -axis as “X” and the y -axis “F(x)”. Turn the grid on.

$$\text{plot}(x, y), \text{xlabel}('X'), \text{ylabel}('F(x)'), \text{grid}$$



2. Compute the following problems using MATLAB when:

a) Express $f(x)$ and $g(x)$ in MATLAB.

$$f(x) = x^2 - 5x + 1$$

$$g(x) = x^2 - 3x + 7$$

$$f = [1, -5, 1]$$

$$g = [1, -3, 7]$$

b) Compute $h(x) = f(x) * g(x)$

$$h = \text{conv}(f, g)$$

$$\text{ans} = 1 \ -8 \ 23 \ -38 \ 7$$

$$\Rightarrow x^4 - 8x^3 + 23x^2 - 38x + 7$$

c) Compute $h(x) = f(x)/g(x)$

$[a,b] = \text{deconv}(f, g)$

$a = 1$

$b =$

$0 \ -2 \ -6$

$$\implies f(x) = 1 \times g(x) - 2x - 6$$