Matt McDade

Applied Numerical Methods HW 1

**Problem 1:**

|  |  |
| --- | --- |
| CODE  x = [1 2 3 4]  y = [2 1 -2 3]  % x \* y  x .\* y  x ./ y  x .^ y  x + y  x - y | OUTPUT  x =  1 2 3 4  y =  2 1 -2 3  ans =  2 2 -6 12  ans =  0.5000 2.0000 -1.5000 1.3333  ans =  1.0000 2.0000 0.1111 64.0000  ans =  3 3 1 7  ans =  -1 1 5 1 |

**Problem 2:**

|  |  |
| --- | --- |
| CODE  h = 1;  x = 5:h:10;  y = sqrt(x.^3 + 1) .\* sin(x);  figure(1)  plot(x, y)  h = .01;  x = 5:h:10;  y = sqrt(x.^3 + 1) .\* sin(x);  figure(2)  plot(x, y) | OUTPUT  Figure 1:    Figure 2: |

**Problem 3:**

|  |  |
| --- | --- |
| CODE  h = 1;  x = 5:h:10;  y = sqrt(x.^3 + 1) .\* sin(x);  figure(1)  plot(x, y)  h = .01;  x = 5:h:10;  y = sqrt(x.^3 + 1) .\* sin(x);  figure(2)  plot(x, y) | OUTPUT  Figure 1: |

**Problem 4:**

|  |  |
| --- | --- |
| CODE  f = @(x) (exp(x).\*sin(x)) ./ (x.^2 + 1);    x1 = 3:1:7;  y1 = f(x1);    x2 = 3:0.01:7;  y2 = f(x2);    figure(1)  plot(x1, y1, 'o', x2, y2) | OUTPUT  Figure 1:  C:\Users\Matt\Desktop\ayy\School\schoolwork\anm\hw1\p4_figure_1.jpg |

**Problem 5:**

|  |  |
| --- | --- |
| CODE  f = @(x) sin(x.^3);    fprintf('f(%.8f) = %.10e \n', 5.201, f(5.201))  fprintf('f(%.8f) = %.10e \n', -8323.6, f(-8323.6))  fprintf('f(%.8f) = %.10e \n', 0.0003, f(0.0003)) | OUTPUT  f(5.20100000) = 6.3076122538e-01  f(-8323.60000000) = -5.2794696417e-01  f(0.00030000) = 2.7000000000e-11 |

**Problem 6:**

|  |  |
| --- | --- |
| CODE  [xpA, xmA] = quadform(1, -10^5, 1)  [xpB, xmB] = quadform(6 \* 10^30, 5 \* 10^30, -4 \* 10^30)  [xpC, xmC] = quadform(10^-30, -10^30, 10^30)  function [xp, xm] = quadform(a, b, c)  if (b < 0)  xp = -b + sqrt(b^2 - 4\*a\*c);  xm = c / (a \* xp);  else  xm = -b - sqrt(b^2 - 4\*a\*c);  xp = c / (a \* xm);  end | OUTPUT  xpA =  2.0000e+05  xmA =  5.0000e-06  xpB =  4.1667e-32  xmB =  -1.6000e+31  xpC =  2.0000e+30  xmC =  5.0000e+29 |