# Midterm 1

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ENGI-111-01

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# Question 1

```
roots([13, 182, -184, 2503])
```

```
ans =

 -15.6850 + 0.0000i
   0.8425 + 3.4008i
   0.8425 - 3.4008i
```

# Question 2

```
A = [4 -2 1; 6 8 -5; 7 9 10]
B = [6 9 -4; 7 5 3; -8 2 1]
C = [-4 -5 2; 10 6 1; 3 -9 8]
% a.
left_side_a = A * (B + C)
right_side_a = A * B + A * C
isequal(left_side_a, right_side_a)
% b.
left_side_b = (A * B) * C
right_side_b = A * (B * C)
isequal(left_side_b, right_side_b)
```

```
A =

     4    -2     1
     6     8    -5
     7     9    10
```

```
B =

     6     9    -4
     7     5     3
    -8     2     1


C =

    -4    -5     2
    10     6     1
     3    -9     8


left_side_a =

   -31   -13    -7
   173   147   -25
   117    57   112


right_side_a =

   -31   -13    -7
   173   147   -25
   117    57   112


ans =

  logical

   1


left_side_b =

         209         347        -136
         297        -111         308
        1207         562         250


right_side_b =

         209         347        -136
         297        -111         308
        1207         562         250


ans =

  logical
```

```
   1
```

# Question 3

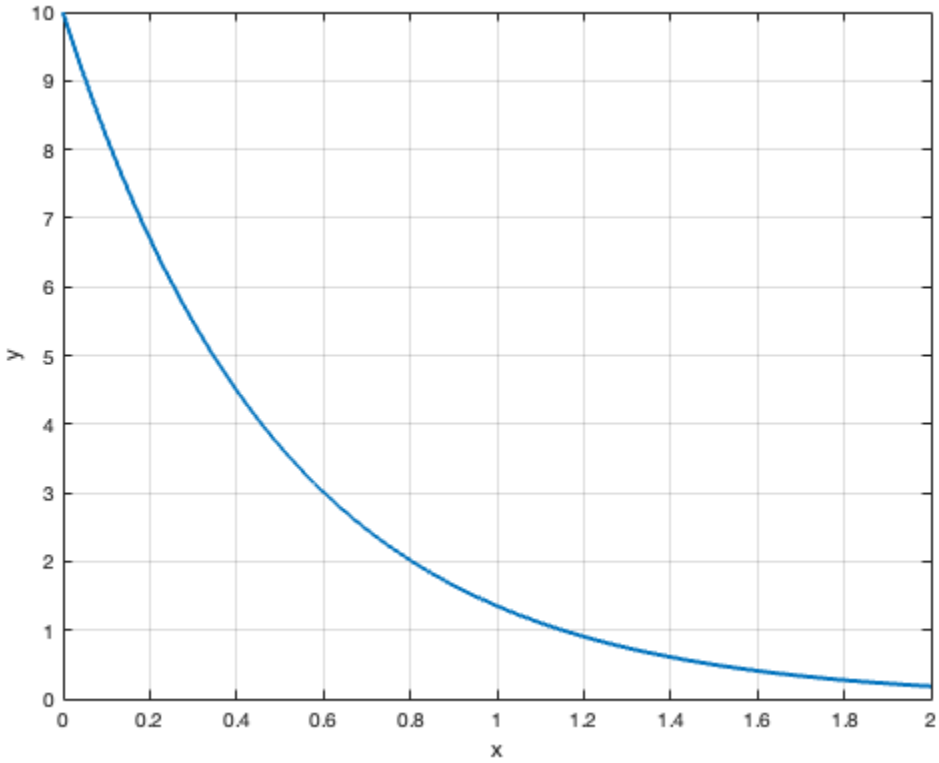
```
y = @(x) 10 * exp(-2 .*  x)
x = 0:0.01:2
plot(x, y(x), 'LineWidth', 2), grid on, xlabel('x'), ylabel('y')
```

```
y =

  function_handle with value:

    @(x)10*exp(-2.*x)
```

```
x =

  Columns 1 through 7

         0    0.0100    0.0200    0.0300    0.0400    0.0500    0.0600

  Columns 8 through 14

    0.0700    0.0800    0.0900    0.1000    0.1100    0.1200    0.1300

  Columns 15 through 21

    0.1400    0.1500    0.1600    0.1700    0.1800    0.1900    0.2000

  Columns 22 through 28

    0.2100    0.2200    0.2300    0.2400    0.2500    0.2600    0.2700

  Columns 29 through 35

    0.2800    0.2900    0.3000    0.3100    0.3200    0.3300    0.3400

  Columns 36 through 42

    0.3500    0.3600    0.3700    0.3800    0.3900    0.4000    0.4100

  Columns 43 through 49

    0.4200    0.4300    0.4400    0.4500    0.4600    0.4700    0.4800

  Columns 50 through 56

    0.4900    0.5000    0.5100    0.5200    0.5300    0.5400    0.5500

  Columns 57 through 63
```

```
  0.5600    0.5700    0.5800    0.5900    0.6000    0.6100    0.6200

Columns 64 through 70

  0.6300    0.6400    0.6500    0.6600    0.6700    0.6800    0.6900

Columns 71 through 77

  0.7000    0.7100    0.7200    0.7300    0.7400    0.7500    0.7600

Columns 78 through 84

  0.7700    0.7800    0.7900    0.8000    0.8100    0.8200    0.8300

Columns 85 through 91

  0.8400    0.8500    0.8600    0.8700    0.8800    0.8900    0.9000

Columns 92 through 98

  0.9100    0.9200    0.9300    0.9400    0.9500    0.9600    0.9700

Columns 99 through 105

  0.9800    0.9900    1.0000    1.0100    1.0200    1.0300    1.0400

Columns 106 through 112

  1.0500    1.0600    1.0700    1.0800    1.0900    1.1000    1.1100

Columns 113 through 119

  1.1200    1.1300    1.1400    1.1500    1.1600    1.1700    1.1800

Columns 120 through 126

  1.1900    1.2000    1.2100    1.2200    1.2300    1.2400    1.2500

Columns 127 through 133

  1.2600    1.2700    1.2800    1.2900    1.3000    1.3100    1.3200

Columns 134 through 140

  1.3300    1.3400    1.3500    1.3600    1.3700    1.3800    1.3900

Columns 141 through 147

  1.4000    1.4100    1.4200    1.4300    1.4400    1.4500    1.4600

Columns 148 through 154

  1.4700    1.4800    1.4900    1.5000    1.5100    1.5200    1.5300
```

```
Columns 155 through 161

  1.5400    1.5500    1.5600    1.5700    1.5800    1.5900    1.6000

Columns 162 through 168

  1.6100    1.6200    1.6300    1.6400    1.6500    1.6600    1.6700

Columns 169 through 175

  1.6800    1.6900    1.7000    1.7100    1.7200    1.7300    1.7400

Columns 176 through 182

  1.7500    1.7600    1.7700    1.7800    1.7900    1.8000    1.8100

Columns 183 through 189

  1.8200    1.8300    1.8400    1.8500    1.8600    1.8700    1.8800

Columns 190 through 196

  1.8900    1.9000    1.9100    1.9200    1.9300    1.9400    1.9500

Columns 197 through 201

  1.9600    1.9700    1.9800    1.9900    2.0000
```




# Question 4

a.

```
u = 0:3:12
% b.
w = 2 * u
% c.
w(2)
% d.
m = length(w)
% e.
u(4) = 1
% f.
[p,q] = max(u)
% g.
w(q)
```

```
u =

     0     3     6     9    12


w =
```

```
     0     6    12    18    24

ans =

     6

m =

     5

u =

     0     3     6     1    12

p =

    12

q =

     5

ans =

    24
```

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