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```
% Matlab for Engineers, Third Edition
% Chapter 2 & 3 Homework

clear, clc
```

Problem 2.3

```
% The following calculations demonstrate the order of
% operations in MATLAB which follow the standard algebraic
% rules for the order of operations.
% First, the calculations inside the parentheses are performed
% from the innermost set to the outermost.
% Next, the exponentiation operations are performed.
% Then, the multiplication and division operations are
% performed from left to right.
% Finally, the addition and subtraction operations are
% performed from left to right.

5^2
(5 + 3)/(5*6)
sqrt(4 + 6^3)
9 + 6/12 + 7*5^(3+2)
1 + (5*3/6^2) + (2^(2-4))*1/5.5
```

```
ans =

    25


ans =

    0.2667


ans =

   14.8324
```

```
ans =

   2.1884e+04


ans =

    1.4621
```

Problem 2.5

```
% (a)
square_edge = 5     % Defines the length of the edge
                    % of a square
Area_of_square = square_edge^2  % Calculates the area of
                                % the square
% (b)
cube1_edge = 10     % Defines the length of the edge
                    % of a cube
Surface_Area_of_cube1 = 6*cube1_edge^2  % Calculates the surface area
                                        % of the cube
% (c)
cube2_edge = 12     % Defines the length of the edge
                    % of a cube
Volume_of_cube2 = cube2_edge^3  % Calculates the volume
                                % of the cube
```

```
square_edge =

     5


Area_of_square =

    25


cube1_edge =

    10


Surface_Area_of_cube1 =

   600


cube2_edge =

    12
```

```
Volume_of_cube2 =

        1728
```

Problem 2.12

```
% (a)
a = 1:20      % a is an evenly spaced vector
              % containing 20 elements
% (b)
b = [0:(pi/10):(2*pi)]  % b is a vector from 0 to
                        % 2*pi with increments of pi/10
% (c)
c = linspace(4, 20, 15) % c is a vector of 15 values
                        % from 4 to 20
% (d)
d = logspace(1, 3, 10)  % d is a vector of 10 values
                        % between 10^1 to 10^3


a =

  Columns 1 through 13

     1     2     3     4     5     6     7     8     9    10    11
 12    13

  Columns 14 through 20

    14    15    16    17    18    19    20


b =

  Columns 1 through 7

         0    0.3142    0.6283    0.9425    1.2566    1.5708    1.8850

  Columns 8 through 14

    2.1991    2.5133    2.8274    3.1416    3.4558    3.7699    4.0841

  Columns 15 through 21

    4.3982    4.7124    5.0265    5.3407    5.6549    5.9690    6.2832


c =

  Columns 1 through 7
```

```
    4.0000    5.1429    6.2857    7.4286    8.5714    9.7143   10.8571

  Columns 8 through 14

   12.0000   13.1429   14.2857   15.4286   16.5714   17.7143   18.8571

  Column 15

   20.0000


d =

   1.0e+03 *

  Columns 1 through 7

    0.0100    0.0167    0.0278    0.0464    0.0774    0.1292    0.2154

  Columns 8 through 10

    0.3594    0.5995    1.0000
```

Problem 3.13

```
distance = 120      % Distance from the point of line
                    % of sight to the building
theta = [30+3, 30-3] % Maximum and minimum values for
                     % the angle of the line of sight
                     % stored in a matrix
radians = theta*pi./180 % Converts the maximum and
                        % minimum values of theta from
                        % degrees to radians
heights = distance*tan(radians) % Calculates the maximum
                                % and minimum heights
                                % and displays the values
                                % in a matrix


distance =

   120


theta =

    33    27


radians =
```

```
    0.5760    0.4712


heights =

   77.9289   61.1431
```

Problem 3.18

```
deviation_of_random_numbers = 23.5 % Preferred standard deviation
                                   % of the random numbers
mean_of_random_numbers = 80 % Preferred mean of the random numbers
x = deviation_of_random_numbers*randn(1, 10000) +
 mean_of_random_numbers;
% Generates 10,000 Gaussian random numbers with a standard
% deviation of 23.5 and a mean of 80.
% The ouput is suppressed by using a semicolon at the end of
% line, so the command prompt is not overwhelmed with data.
mean_confirmation = mean(x) % Confirms the mean of the 10,000 Gaussian
                            % random numbers to be 80 by taking
                            %the mean of x.
std_confirmation = std(x) % Confirms the standard deviation of the
                          % 10,000 Gaussian random numbers to be
                          % 23.5 by using the std function to
                          %evaluate x.
```

```
deviation_of_random_numbers =

   23.5000


mean_of_random_numbers =

    80


mean_confirmation =

   80.0047


std_confirmation =

   23.2469
```

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