Aaron Klapheck

```
% Ch 3. Assignment #7       due 10/24
clear, clc
Date = date
```

```
Date =

22-Oct-2007
```

Problem 14

```
% Given: V(t) = 10^9 + 10^8*(1 - exp(-t/100)) - r*t.
% Where V is the volume of water in L, t is the time in days, and r is
% the town's consumption rate of water in L/day.


Percentage_of_Water_Loss(50,10^7);
```

```
Warning: The value of local variables may have been changed to match the
         globals.  Future versions of MATLAB will require that you declare
         a variable to be global before you use that variable.
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         globals.  Future versions of MATLAB will require that you declare
         a variable to be global before you use that variable.

Days_Needed =

   54.1832
```

Problem 16a (compute V & A for a between 0.25 & 4 and b = a + 2)

```
% Given: A volume function and an area function for a torus.
% V(a,b) = (1/4*pi^2).*(a+b).*(b-a).^2,
% A(a,b) = pi^2.*(b.^2-a.^2)
% where V = volume, A = area, a = inner radius, and b = outer radius.


a = linspace(0.25, 4, 20);

b = a + 2;

[Area_of_Torus, Volume_of_Torus] = V_and_A(a,b)
```

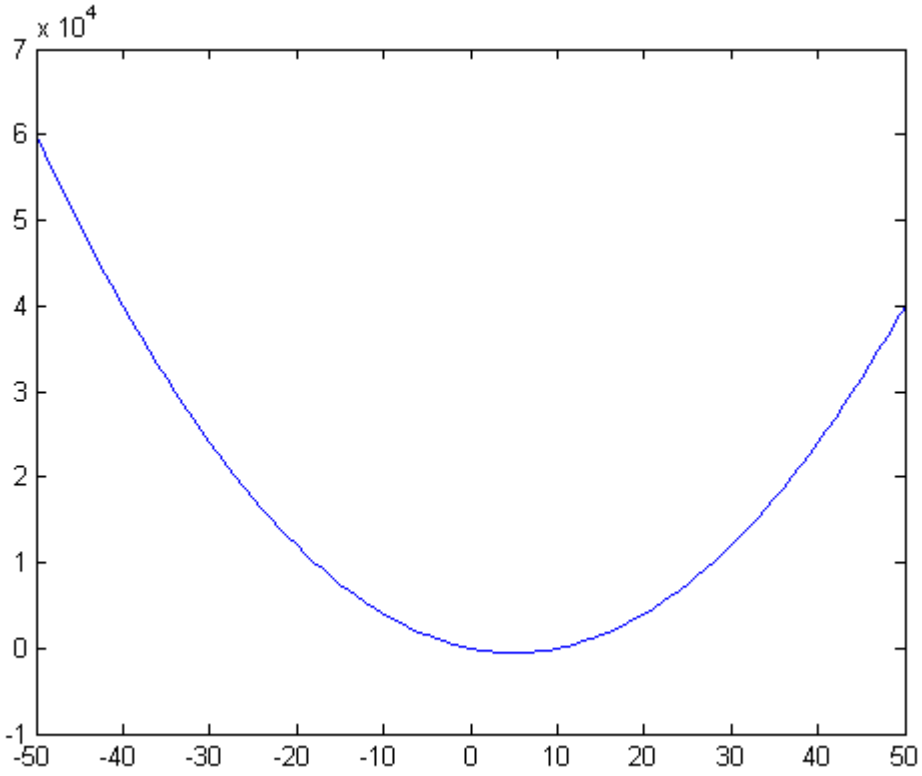
```
Area_of_Torus =

  Columns 1 through 9
```

```
   49.3480   57.1398   64.9316   72.7234   80.5152   88.3070   96.0988  103.8906
111.6824

  Columns 10 through 18

  119.4742  127.2660  135.0577  142.8495  150.6413  158.4331  166.2249  174.0167
181.8085

  Columns 19 through 20

  189.6003  197.3921


Volume_of_Torus =

  Columns 1 through 9

   24.6740   28.5699   32.4658   36.3617   40.2576   44.1535   48.0494   51.9453
55.8412

  Columns 10 through 18

   59.7371   63.6330   67.5289   71.4248   75.3207   79.2166   83.1125   87.0084
90.9043

  Columns 19 through 20

   94.8001   98.6960
```

Problem 20b

```
poly = @(x) (20*x.^2 - 200.*x + 3)

% General location of minimum
interval = [-50:1:50];
plot(interval, poly(interval));         % a.

% The mimimum is around x = 8.

[position, value] = fminbnd(poly,0,8)   % b.
```

```
poly =

    @(x) (20*x.^2 - 200.*x + 3)


position =

    5.0000


value =

  -497
```



Problem 23

```
% The function Minimum_of_f1 computes the minumum of of the function
% f1, where f1 = 20*x^2-200*x +3.


f1 = Minimum_of_f1(20, 200, 3);

[x_value, y_value] = fminbnd(f1, 0, 10)
```

```
x_value =

    5.0000

y_value =

  -497
```

Problem 24

```
% Load a

load matrix.txt

matrix

Mean_Value_of_Each_Column = mean(matrix, 1)
```

```
matrix =

    55    42    98
    51    39    95
    63    43    94
    58    45    90


Mean_Value_of_Each_Column =

   56.7500   42.2500   94.2500
```

Problem 25

```
A = xlsread('matrix_1')

Sum_of_Each_Column = sum(A)
```

```
A =

    55    42    98
    51    39    95
    63    43    94
    58    45    90


Sum_of_Each_Column =

   227   169   377
```

```
%% Function 1 for problem number 14

function Days_Needed = Percentage_of_Water_Loss(x,r)

global r x

Days_Needed = fzero('Water_Volume_and_Time', 1)


%% Function 2 for problem number 14

function Total_Volume = Water_Volume_and_Time(t)

global r x

V = (10^9 + (10^8)*(1 - exp(-t/100)) - r*t);

Total_Volume = (V - .01*x*10^9);


%% Function to find Area and Volume for problem number 16

function [Area_of_Torus, Volume_of_Torus] = V_and_A(a,b)


Area_of_Torus = pi^2.*(b.^2-a.^2);

Volume_of_Torus = (1/4*pi^2).*(a+b).*(b-a).^2;


%% Function of volume for problem number 23

function f1 = Minimum_of_f1(a,b,c);

f1 = @d;
    function y = d(x)
        y = a.*x.^2-b.*x + c;
    end
end
```