CS368 Spring 2017
Homework Assignment 2

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- Due Date: Friday, February 17 by 11:59 pm

Problem 1: Creating a tip table

Create and display a matrix with four columns:

- column 1 contains bill totals from $5 to $100 in increments of $5
- column 2 contains the tip amount if the tip is 15% of the bill
- column 3 contains the tip amount if the tip is 18% of the bill
- column 4 contains the tip amount if the tip is 20% of the bill

```
clear
format bank  % this will format money values nicely

bills = [5:5:100]';
tiptable = [bills, bills * 0.15, bills * 0.18, bills * 0.20];
disp(tiptable);

format short % change formatting back to default setting
```

```
    5.00    0.75    0.90    1.00
   10.00    1.50    1.80    2.00
   15.00    2.25    2.70    3.00
   20.00    3.00    3.60    4.00
   25.00    3.75    4.50    5.00
   30.00    4.50    5.40    6.00
   35.00    5.25    6.30    7.00
   40.00    6.00    7.20    8.00
   45.00    6.75    8.10    9.00
   50.00    7.50    9.00   10.00
   55.00    8.25    9.90   11.00
   60.00    9.00   10.80   12.00
   65.00    9.75   11.70   13.00
   70.00   10.50   12.60   14.00
```

```
    75.00      11.25      13.50      15.00
    80.00      12.00      14.40      16.00
    85.00      12.75      15.30      17.00
    90.00      13.50      16.20      18.00
    95.00      14.25      17.10      19.00
   100.00      15.00      18.00      20.00
```

Problem 2: Density of freshwater

Compute the density of freshwater as a function of temperature

- Temperature at 40 °F, 68 °F, and 100 °F

```
clear

temperF = [40, 68, 100];
temperC = 5/9 * (temperF - 32);
rho = 5.5289 * 10^(-8) * temperC.^3 - 8.5016 * 10^(-6) *
 temperC.^2 ...
+ 6.5622 * 10^(-5) * temperC + 0.99987;

disp(['Freshwater density is ', num2str(rho(1)), ' at ',
 num2str(temperF(1)), ' F'])
disp(['Freshwater density is ', num2str(rho(2)), ' at ',
 num2str(temperF(2)), ' F'])
disp(['Freshwater density is ', num2str(rho(3)), ' at ',
 num2str(temperF(3)), ' F'])
```

```
Freshwater density is 1 at 40 F
Freshwater density is 0.99822 at 68 F
Freshwater density is 0.9932 at 100 F
```

Problem 3 (8 points) : Distance to horizon

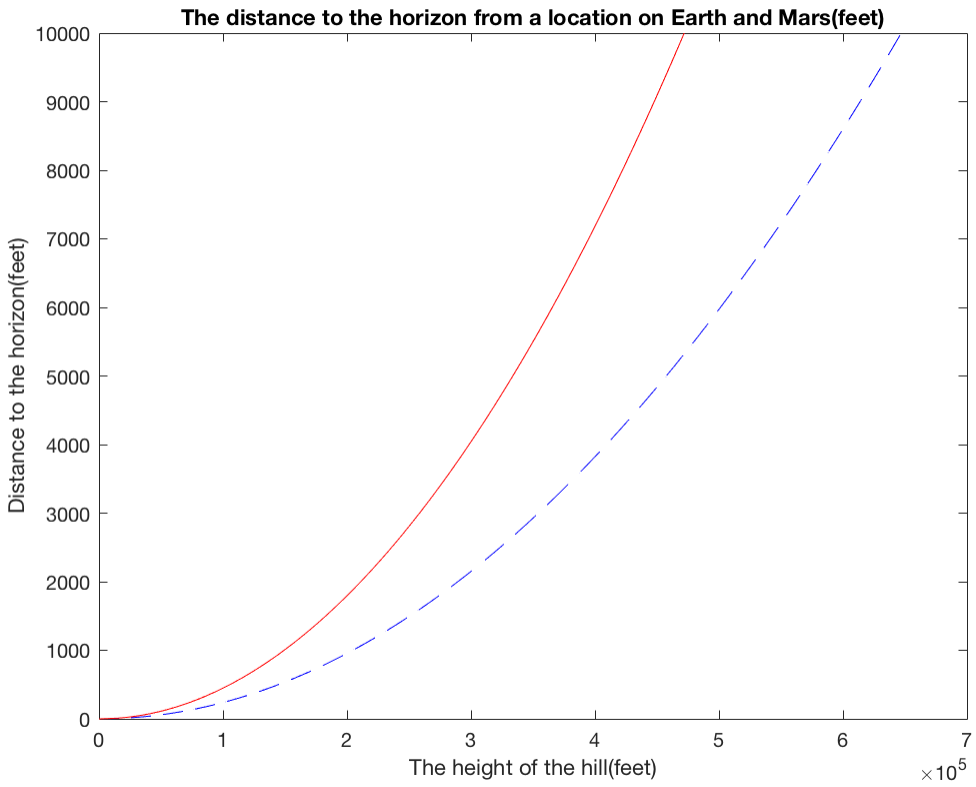
Plot the distance to the horizon vs the height of a hill for hill heights from 0 to 10,000 feet on Earth and Mars on one plot figure

```
clear

rE = 7926 / 2 * 5280;
rM = 4217 / 2 * 5280;
h = 0 : 10 : 10000;

dE = sqrt(2 * rE * h + h.^2);
dM = sqrt(2 * rM * h + h.^2);

plot(dE, h, 'b--', dM, h, 'r');
title('The distance to the horizon from a location on Earth and
 Mars(feet)');
xlabel('The height of the hill(feet)');
ylabel('Distance to the horizon(feet)');
```



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