ENGR 1204 Programming Languages in Engineering
MATLAB Lab 6 (Vector, Plotting)

Write a MATLAB program (.M script file) to calculate the time to drain a cylindrical water tank for an initial water height ranging from 1 to 10 feet. The tank has a radius (rt) of 2 feet and the drain radius (ro) is 0.3 inch. The gravitational constant is 32.2 feet/sec.^{2}

 The formula for time to drain the tank is

$$\text{time} = (rt / ro)^2 \, h / vavg$$

$$\text{where } vavg = 0.5 \, (2 \, g \, h)^{1/2} \qquad \text{(average velocity)}$$

In your program, assign the values to rt, ro, and g. Create and display a vector **h** for the initial water heights of 1, 2, 3, …, 10 feet. Use the formula above to calculate and display **vavg** in ft./sec. and **time** in hours. Use **plot** to create a graph of time as a function of height, and insert a grid along with appropriate axis labels and title.

Run the program and observe the plot and results in the command window.