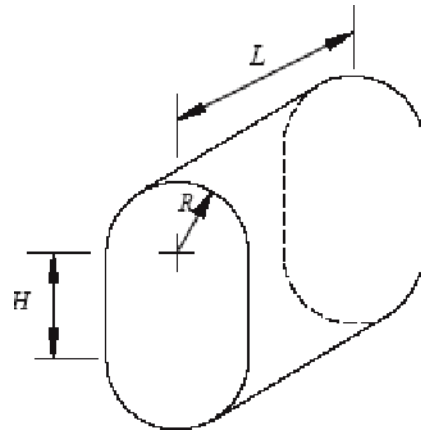


Homework 1

1. The diagram to the right shows an oval tank that might be used to contain home heating oil. The volume of the tank is $V=LA_{end}$, where $A_{end} = \pi R^2 + 2RH$ is the area of the end of the tank. The surface area of the tank is $A_s = 2A_{end} + (2\pi R + 2H)L$

- i. Write a Matlab function to compute the volume of the tank as a function of L. Assume that $R = 2$ and $H = 1.5$, i.e., assign these fixed values to variables in the function. Do not print the value of V in the function. Return the value of V as an output parameter of the function.
- ii. Extend the Matlab function obtained in the preceding exercise so that L, R, and H are all inputs to the function.
- iii. Extend the Matlab function obtained in the preceding exercise so that V and A_s are returned from the function.



2. Write an m-file that returns the plot of $y=5\sqrt{k^{0.5}}$ over the range $1 \leq k \leq 5$ in discrete increments of $\Delta k = 0.5$ as long as $|y| = 8$. Do not forget to label the graph.

3. The electricity accounts of residents in a very small town are calculated as follows:

- if 500 units or less are used the cost is 2 cents per unit;
- if more than 500, but not more than 1000 units are used, the cost is \$10 for the first 500 units, and then 5 cents for every unit in excess of 500;
- if more than 1000 units are used, the cost is \$35 for the first 1000 units plus 10 cents for every unit in excess of 1000;
- in addition, a basic service fee of \$5 is charged, no matter how much electricity is used.

Write a program which enters the following five consumptions into a vector, and uses a for loop to calculate and display the total charge for each one: 200, 500, 700, 1000, 1500.