

## Practice Assignment 2

Scientific Computing with MATLAB

due: Sep 20, 2018

Given parabolic flight, the height  $y$  of a ball is given by the equation:

$$y = x \tan(\theta) - \left[ \frac{1}{2v_0^2} \right] \left[ \frac{gx^2}{\cos(\theta)^2} \right] + y_0 \quad (1)$$

where  $x$  is a horizontal coordinate (metres),  $g$  is the acceleration of gravity (metres per second per second),  $v_0$  is the initial velocity (metres per second) at an angle  $\theta$  (radians) with the x-axis, and  $(0, y_0)$  is the initial position of the ball (metres).

Write a program to compute the vertical height  $y$  of a ball. The program should ask the user to input values for  $g$ ,  $v_0$ ,  $\theta$ ,  $x$ , and  $y_0$ , and print out a sentence giving the vertical height of the ball.

Test your program with this example:

```
enter a value for g (m/s/s): 9.8
enter a value for v0 (m/s): 6.789
enter a value for theta (rad): 0.123
enter a value for x (m): 4.5
enter a value for y0 (m): 5.4
The vertical height of the ball is: 3.77057803072 m
```