

# [ PROBLEM OF THE WEEK #2 ]

# 97 ON PAGE 512

**PROJECTILE FLIGHT:** IF A PROJECTILE IS FIRED w/ INITIAL VELOCITY OF  $V$  FEET PER SECOND AT AN ANGLE  $\theta$  w/ THE HORIZONTAL, IT WILL FOLLOW A PARABOLIC PATH DESCRIBED BY

$$y = \frac{-16x^2}{v^2(\cos\theta)^2} + x \tan\theta$$

↳ IF  $V = 750$  AND  $\theta = 30^\circ$ , GRAPH THE PATH OF THE PROJECTILE (USE  $[0, 20,000, 5000]$  BY  $[0, 4000, 1000]$  WINDOW - MAKE SURE YOU ARE IN DEGREES).

a) FIND THE MAXIMUM HEIGHT OF THE FLIGHT.

b) ASSUMING THE GROUND IS FLAT (SEE PICTURE BELOW) FIND THE TOTAL HORIZONTAL DISTANCE TRAVELED BY THE PROJECTILE

c) ASSUME THAT THE PROJECTILE IS FIRED FROM THE BASE OF A HILL WHOSE SLOPE IS MODELED BY  $y = .2x$ . APPROXIMATE THE TOTAL HORIZONTAL DISTANCE TRAVELED BY THE PROJECTILE.

