

## Problem 29

Suppose that a rocket is launched straight up from the surface of the earth with initial velocity  $v_0 = \sqrt{2gR}$ , where  $R$  is the radius of the earth. Neglect air resistance.

- (a) Find an expression for the velocity  $v$  in terms of the distance  $x$  from the surface of the earth.
- (b) Find the time required for the rocket to go 240,000 mi (the approximate distance from the earth to the moon). Assume that  $R = 4000$  mi.