Physics Problem Set 4.3

Useful Equations

$\Delta x = v_o t + \frac{1}{2} a t^2$

$V_f = V_o + at$, which is this equation re-arranged: $a = (v_f - v_o)/t$

$V_f^2 = V_o^2 + 2a\Delta x$

$V_{ave} = \frac{1}{2} (V_f + V_o)$

You can use 10m/s/s for the value of g. Use this for the acceleration of anything dropped or thrown up in the air.

1. A furry fuzzy bunny drops a bowling ball from the roof of a 5 meter high building.
    a. What is the ball's acceleration while it is falling?

    b. How long does it take for the ball to reach the ground?

    c. What is the speed of the ball just before it hits the ground?

2. This bad bunny drives her lambo from rest to a speed of 30 m/s in 6 seconds.
    a. What is the initial velocity of the lambo? (V_o)

    b. What is the lambo's final velocity? (V_f)

    c. What is the time in this problem? (t)

    d. What is the lambo's acceleration? (a)

    e. How far does the lambo travel? (Δx)

3. Peter the pilot bunny touches down on the runway with an initial velocity of 40 m/s and slows down to stop in 80 seconds.
    a. What is V_o?
    b. What is V_f?
    c. What is V_{ave}?
    d. What is t?
    e. What is the plane's acceleration? (a)

    f. What distance does the plane travel while landing? (Δx)