Acceleration Equations:

$$\rightarrow a = \frac{v_f - v_i}{t}$$

$$\Delta d = v_i t + \frac{1}{2} a t^2$$

$$v_f^2 = v_i^2 + 2 a \Delta d$$

A ball rolls down a hill from rest and attains a velocity of 10 m/s in 7s. How far did the ball roll?

$V_i = 0$

$V_f = 10$

$t = 7s$

$a = ?$

$d = ?$

$a = \frac{V_f - V_i}{t}$

$a = \frac{10}{7} = 1.4 m/s^2$

$d = V_i t + \frac{1}{2} a t^2$

$= \frac{1}{2}(1.4)(7)^2$

$= 34.3m$

A car has an initial velocity of 7 m/s. How fast will it be moving if it accelerates at 3.75 m/s^2 for 200 m.

$V_i = 7\ m/s$

$d = 200\ m$

$a = 3.75\ m/s^2$

$V_f =$

$V_f^2 = V_i^2 + 2a\Delta d$

$V_f = \sqrt{V_i^2 + 2a\Delta d}$

$= \sqrt{7^2 + 2(3.75)(200)}$

$V_f = 39.4\ \frac{m}{s}$

A car accelerates from $3\frac{m}{s}$ at a rate of $4\ m/s^2$. Eventually it reaches $20\frac{m}{s}$. How far did it move during this time?

$a = 4\frac{m}{s^2}$

$v_i = 3\frac{m}{s}$

$v_f = 20\frac{m}{s}$

$d = ?$

$$v_f^2 = v_i^2 + 2ad$$

$$d = \frac{v_f^2 - v_i^2}{2a}$$

$$= \frac{(20^2 - 3^2) \div}{(2(4))}$$

$d = 47.9\ m$

A ball rolls up a hill w/ an initial velocity of $8\frac{m}{s}$. It accelerates at $-2\ m/s^2$ until it comes to a stop. How far does it roll before stopping?

$v_i = 8\frac{m}{s}$

$v_f = 0$

$a = -2\ m/s^2$

$d = ?$

$$d = \frac{v_f^2 - v_i^2}{2a}$$

$$= \frac{0 - 8^2}{2(-2)} = 16m$$

$a = ?\ -2$

$a = \frac{v_f - v_i}{t}$

$v_f = 0 \quad t = \frac{0-8}{-2}$

$v_i = 8 \quad t = 4$

$t =$

$d = v_i t + \frac{1}{2} a t^2$

$= 8(4) + \frac{1}{2}(-2)(4)^2$

$d = 16\,m$

p. 61 #3

p. 64 #6-9

p. 69 #26-29

p. 70 #30-32