88. $v_i = 0\ m/s$

$\bar{a} = 49\ m/s^2$

$\Delta d = 325\ m$

$v_f = ?$

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

$= \sqrt{0 + 2(49)(325)}$

$= 180\ m/s$

90. $\bar{a} = -11\ m/s^2$

a) $v_f = 0$

$v_i = 55\ m/s$

$v_f^2 = v_i^2 + 2\bar{a}\Delta d$

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

$= \frac{0 - 55^2}{2(-11)}$

$= 140\ m$

b)

$\Delta d = v_f^2 - (2v_i)^2$

= since v_i is squared, it will be four times as much

$\Delta d = \frac{v_f^2 - (110)^2}{2(-11)}$

$= 550\ m$

91. $v_i = 20.0\ m/s$

$\Delta t = .80\ s$

$\Delta d = v_i \Delta t$

$= (20.0)(.80)$

$= 16\ m$

$29\ m + 16\ m = 145\ m$

$v_i = 20\ m/s$

$v_f = 0\ m/s$

$\bar{a} = -7.0\ m/s^2$

$v_f^2 = v_i^2 + 2\bar{a}\Delta d$

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

$= \frac{0 - 20^2}{2(-7.0)}$

$= 29\ m$

93. $\Delta t = 15\ s$

$v_i = 145\ m/s$

$v_f = 75\ m/s$

$\Delta d = \bar{v}\Delta t$

$= \left(\frac{v_i + v_f}{2}\right)\Delta t$

$= \left(\frac{145 + 75}{2}\right)(15)$

$= 1650$

$= 1700\ m$

94. $v_c = 30.0\ m/s$

$v_{ip} = 0\ m/s$

$\bar{a}_p = 7.0\ m/s^2$

$\Delta d_c = v_c \Delta t$

$\Delta d_p = v_{ip}\Delta t + \frac{1}{2}\bar{a}_p \Delta t^2$

they go the same distance so $\Delta d_c = \Delta d_p$

$v_c \Delta t = v_{ip}\Delta t + \frac{1}{2}\bar{a}_p \Delta t^2$

$v_c = v_{ip} + \frac{1}{2}\bar{a}_p \Delta t$

$\Delta t = \frac{2(v_c - v_{ip})}{\bar{a}_p}$

$= 8.6\ s$

$v_{fp} = v_{ip} + \bar{a}\Delta t$

$= 0 + (7.0)(8.6)$

$= 60.\ m/s$

104. on your own

112.

$v_{it} = 0\ m/s$

$\bar{a}_t = 2.5\ m/s^2$

$v_c = 15\ m/s$

$\Delta d_c = v_c \Delta t$

$\Delta d_t = v_{it}\Delta t + \frac{1}{2}\bar{a}_t \Delta t^2$

$\Delta d_t = \Delta d_c$

$v_{it}\Delta t + \frac{1}{2}\bar{a}\Delta t^2 = v_c \Delta t$

$v_{it} + \frac{1}{2}\bar{a}\Delta t = v_c$

$\Delta t = \frac{2(v_c - v_{it})}{\bar{a}}$

$= \frac{2(15.0 - 0)}{2.5}$

$= 12\ s$

$\Delta d_c = v_c \Delta t$

$= (15)(12)$

$= 180\ m$