


Phy
HW 5.4

69)




$a = -9.80 \text{ m/s}^2$
 $\Delta t = 2.0 \text{ s}$
 $V = ?$
 $\Delta d = ?$

$V = V_0 + at$
 $V = 0 \text{ m/s} + (-9.80 \text{ m/s}^2)(2.0 \text{ s})$
 $V = 19.6 \text{ m/s} = 20. \text{ m/s}$

$\Delta d = d_0 + V_0 t + \frac{1}{2} a t^2$
 $d = 0 \text{ m} + (0 \text{ m/s})(2.) + \frac{1}{2} (-9.80 \text{ m/s}^2)(2.0 \text{ s})^2$
 $d = 19.6 \text{ m} = 20. \text{ m}$

70)




$a = -9.80 \text{ m/s}^2$
 $\Delta d = ?$
 $V = -73.5 \text{ m/s}$
 $\Delta t = ?$

$V = V_0 + at$
 $t = \frac{V - V_0}{a} = \frac{-73.5 \text{ m/s} - 0 \text{ m/s}}{-9.80 \text{ m/s}^2}$
 $t = 7.50 \text{ s}$

$d = d_0 + V_0 t + \frac{1}{2} a t^2$
 $d = \frac{1}{2} (-9.80 \text{ m/s}^2)(7.5 \text{ s})^2$
 $d = -276 \text{ m}$

73)



$V_0 = 5.0 \text{ m/s}$
 $a = -9.80 \text{ m/s}^2$
 $\Delta t = 2.0 \text{ s}$
 $\Delta V = ?$

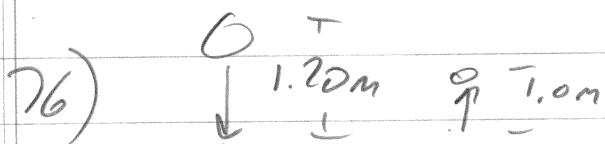
$V = V_0 + at$
 $V = 5.0 \text{ m/s} + (-9.80 \text{ m/s}^2)(2.0 \text{ s})$
 $V = -15 \text{ m/s}$

$\Delta d = d_0 + V_0 t + \frac{1}{2} a t^2$
 $d = 0 \text{ m} + (5.0 \text{ m/s})(2.0 \text{ s}) + \frac{1}{2} (-9.80 \text{ m/s}^2)(2.0 \text{ s})^2$
 $d = -9.6 \text{ m}$

Helicopter Position =

$d = Vt = (5.0 \text{ m/s})(2.0 \text{ s}) = 10. \text{ m}$

difference is $10.0 \text{ m} - (-9.6 \text{ m}) = 19.6 \text{ m} \text{ or } 20. \text{ m}$ below Heli.



$$v^2 = v_0^2 + 2a \Delta d$$

A) $v = \sqrt{0 \text{ m/s}^2 + 2(-9.80 \text{ m/s}^2)(1.20 \text{ m})} = -4.85 \text{ m/s}$

B) $v^2 = v_0^2 + 2a \Delta d$

$$v_0 = \sqrt{v^2 - 2a \Delta d} = \sqrt{0 \text{ m/s}^2 - 2(-9.80 \text{ m/s}^2)(-1.0 \text{ m} - 0 \text{ m})}$$

$v_0 = -4.43 \text{ m/s}$

C) $\Delta t = 0.10 \text{ s}$

$$v = v_0 + at$$

$$v_0 = 4.85 \text{ m/s}$$

$$a = \frac{v - v_0}{t} = \frac{-4.43 \text{ m/s} - (-4.85 \text{ m/s})}{0.10 \text{ s}}$$

$$v = 4.43 \text{ m/s}$$

$$a = ?$$

$$a = 928 \text{ m/s}^2 = 930 \text{ m/s}^2$$

$$\frac{930 \text{ m/s}^2}{9.8} = 95 \times \text{gravity}$$

74) $v_0 = -5.0 \text{ m/s}$
 $\Delta t = 2.0 \text{ s}$

A) $v = v_0 + at = -5.0 \text{ m/s} + (-9.80 \text{ m/s}^2)(2.0 \text{ s})$

$$v = -24.6 \text{ m/s} = -25 \text{ m/s}$$

B) $d = d_0 + v_0 t + \frac{1}{2} a t^2 = 0 \text{ m} + (-5.0 \text{ m/s})(2.0 \text{ s}) + \frac{1}{2} (-9.80 \text{ m/s}^2)(2.0 \text{ s})^2$

$$d = -29.6 \text{ m} = -30 \text{ m}$$

C) $d_H = v_0 t = (-5.0 \text{ m/s})(2.0 \text{ s}) = -10 \text{ m}$ So $-30 \text{ m} - (-10 \text{ m})$

$$= -20 \text{ m}$$