

10/10/14 HAND.

#2

$v_0 = -1.9 \frac{m}{s}$
 $v = ?$
 $g = -9.8 \frac{m}{s^2}$
 $t = ?$
 $\Delta y = -50m$

$\Delta y = y_f - y_0$
 $\Delta y = 0 - 50$
 $\Delta y = -50m$

Oct 14-8:31 AM

$$\Delta y = \frac{v^2 - v_0^2}{2g}$$

$$-50 = \frac{v^2 - (-1.9)^2}{2(-9.8)}$$

$$v^2 = \boxed{\#}$$

$$v = \pm 31.4 \frac{m}{s}$$

$$\boxed{v = -31.4 \frac{m}{s}}$$

Oct 14-8:40 AM

$$d) \quad v = v_0 + at$$

$$-31.4 = -1.9 - 9.8t$$

$$\boxed{t = 3.0 \text{ s}}$$

Oct 14-8:43 AM

Diagram showing two objects, 1 and 2, falling from different heights. Object 1 starts at height y and falls a distance Δy to the ground. Object 2 starts at height 0 and falls a distance y to the ground. Both objects have an initial velocity v_0 .

a) $\Delta y_1 = \Delta y_2$

b) $t_1 < t_2$

c) $v_1 = v_2$

d) $d_1 < d_2$

e) $a_1 = a_2$
 $\underbrace{\hspace{10em}}_g$

Oct 14-8:47 AM

$$a) \quad \Delta y = y_F - y_0$$

$$\Delta y = 0 - y$$

$$\Delta y = -y$$

Displacement is negative according to our coordinate system.

Oct 14-8:53 AM

10/10/14 HANDOUT

#37

$\Delta y = 0$
 $v = ?$
 $v_0 = ?$
 $g = -9.8 \text{ m/s}^2$
 $t = 3 \text{ s}$

$$\Delta y = v_0 \cdot t + \frac{1}{2} g t^2$$

$$0 = v_0 \cdot 3 + \frac{1}{2} (-9.8) (3)^2$$

$$44.1 = v_0 \cdot 3 \quad \boxed{v_0 = 14.7 \text{ m/s}}$$

Oct 14-9:39 AM

$$\Delta y = \frac{1}{2}(v_0 + v_f)t$$

$$\Delta y = \frac{1}{2}(14.7 + 0) 1.5$$

$$\Delta y = 11.0 \text{ m}$$

$v_f = 0$
 $v_0 \uparrow$
 $g \downarrow$
 y

$\Delta y = ?$
 $t = \frac{1}{2}(3 \text{ s})$
 $v_f = 0$
 $v_0 = 14.7 \text{ m/s}$
 $g = -9.8 \text{ m/s}^2$

Oct 14-9:43 AM

HANDOUT 10/9/14

(#30)

$v_f = 0$
 $v_0 \uparrow$
 $g \downarrow$
 2.5
 40 m
 14
 y

$v_0 = ?$
 $v_f = ?$
 $g = -9.8 \frac{\text{m}}{\text{s}^2}$
 $t = 2.0 \text{ s}$
 $\Delta y = 40 \text{ m}$

$$\Delta y = v_0 t + \frac{1}{2} g t^2$$

$$40 = v_0 (2) + \frac{1}{2} (-9.8) (2)^2$$

Oct 14-9:54 AM

$V_0 = 29.8 \frac{m}{s}$
 $V = 0$
 $g = -9.8 \frac{m}{s^2}$
 $t = ?$
 $\Delta y = ?$

$\Delta y = \frac{V^2 - V_0^2}{2g}$
 $\Delta y = \frac{0 - (29.8)^2}{2(-9.8)}$

Oct 14-10:00 AM

$\Delta y = 45.3 \text{ m}$

$45.3 - 40 = 5.3 \text{ m HIGHER}$

$V = V_0 + gt$
 $0 = 29.8 - 9.8t$
 $t = 3.0 \text{ s}$

$3.0 - 2.0 = 1.0 \text{ s ADDITIONAL TIME}$

Oct 14-10:02 AM