

NAME: <u><u><u>R</u>EY</u></u>

- 1. You are standing on the edge of a cliff by the sea and drop a rock. It falls for 4 seconds, and splashes into the water.
 - a. What is the velocuty of the rock just as it hits the water? What about the speed?

$$\begin{array}{l} \begin{array}{l} \begin{array}{l} \psi_{1} = 0 \ m/s \end{array} \quad \psi = \alpha t + \psi_{1}^{*} \\ \alpha = -\omega \ m/s^{2} \end{array} \quad \psi = (-10) \ (4) \end{array} \qquad \begin{array}{l} \begin{array}{l} \psi = -40 \ m/s \end{array} \\ \begin{array}{l} \psi = -20 \ m/s \end{array} \\ \begin{array}{l} \psi = -23 \ m/s \end{array} \\ \begin{array}{l} \psi = -23 \ m/s \end{array} \\ \begin{array}{l} \psi = -23 \ m/s \end{array} \\ \begin{array}{l} \psi = -20 \ m/s \end{array} \\ \end{array}$$
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- 3. A seagull drops a clam onto some rocks in order to crack the shell. The clam falls for 1.25 seconds.
 - a. What is the velocity of the clam just as it hits the ground?

$$a = -10 \text{ m/s}^{-1} \qquad V = at + V;$$

$$V_{c}^{-1} = 0 \text{ m/s} \qquad V = (-10)(1.25) + 0$$

$$f = (.255) \qquad V = -(2.5 \text{ m/s})$$
How high up was the seagull?

b. How high up was the seagull?

$$y = \frac{1}{2}at^{2} + v_{1}t$$

 $y = \frac{1}{2}(-10)(1.25)^{2} + O(1.2)$
 $y = -7.81 \text{ m}$ [So 7.81 m high]

side 1

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Free Fall Problems

NAME:

- 4. A 1.5 kg ball is dropped and falls for 2 meters before hitting the ground. a. How many seconds did it take to fall?
 - $y = \pm at^2 + y \neq t$ y = -2 m $-2 = \frac{1}{2}(-10)t^{2}$ $-2 = -5t^{2}$ a = -10 m/s2 t= 0.63 S $v_c = om/s$
 - b. What is the velocity of the ball just as it hits the ground?

$$V = (-10)(0.63) + 0$$

$$V = -6.3 \ m/s$$

- 5. A painter drops a paintbrush while painting the side of a building. The brush falls 12.8 meters. a. How many seconds does it take to fall?
- $y = \frac{1}{2}at^{2} + v_{i}t$ $-(2 \cdot 8) = \frac{1}{2}(-c_{0})t^{2} + 0$ $t^{2} = 2c56$ $t^{2} = 100$ y = -12.8 m $a = -10 m/s^2$ 2.56 $V_c = 0 m/s$
 - b. How fast is the brush going just as it hits the ground?

$$V = at + V_{c}$$

 $V = (-10)(1.6) + 0$ | $V = -16$ m/s \rightarrow so speed is 16 m/s

6. Someone throws a rock straight down with an initial speed of 7 m/s. It falls for 1.5 seconds. a. What is its velocity when it hits the ground? (*Hint: what is the initial velocity?*)

$$v_i = -7 m/s$$

 $a = -10 m/s^2$
 $t = 1.5 s$
 $V = at + v_i$
 $v = -10 J(1.5) - 7$
 $V = -15 - 7$
 $V = -22 m/s$

b. How far did the rock travel?

$$y = \frac{1}{2}\alpha t^{2} + V_{i}t$$

$$y = \frac{1}{2}(-10)(1.5)^{2} + (-7)(1.5)$$

$$y = -11.25 - 10.5$$

$$y = -21.75 \text{ m} - (50 \text{ ft } \text{Pell } 20.75 \text{ m}.)$$
side 2

Answers:

1. a) –40 m/s (and 40 m/s)	b) 80 m
2. a) 23 m/s	b) 26.5 m
3. a) −12.5 m/s	b) 7.8 m
4. a) 0.63 s	b) –6.3 m/s
5. a) 1.6 s	b) 16 m/s
6. a) <i>–22 m/s</i>	b) 21.8 m