1° Honors Physics - Kinematics freefall quiz 5 09-30-02

A brick is dropped from a 375 m high cliff. (a) How long does it take to hit? (b) What is its final velocity?

$\Delta y = -375\,m$

$v_{iy} = 0\ \frac{m}{s}$

$a = -9.8\ \frac{m}{s^2}$

$t = ___\ s$

$v_{fy} = ___\ \frac{m}{s}$

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

$t = \sqrt{\frac{2\Delta y}{a}}$

$= \sqrt{\frac{2(-375\,m)}{-9.8\ \frac{m}{s^2}}}$

a) $\boxed{t = 8.75\,s}$

$v_{fy} = v_{iy} + at$

$= -9.8\ \frac{m}{s^2}(8.75\,s)$

b) $\boxed{v_{fy} = -85.7\ \frac{m}{s}}$

OR

$v_{fy}^2 = v_{iy}^2 + 2a\Delta y$

$v_{fy}^2 = 2(-9.8\ \frac{m}{s^2})(-375\,m)$

$\boxed{v_{fy} = -85.7\ \frac{m}{s}}$

3° Honors Physics - Kinematics freefall quiz 5 09-30-02

A brick is dropped from a 425 m high cliff. (a) How long does it take to hit? (b) What is its final velocity?

$\Delta y = -425\,m$

$v_{iy} = 0\ \frac{m}{s}$

$a = -9.8\ \frac{m}{s^2}$

$t = ___\ s$

$v_{fy} = ___\ \frac{m}{s}$

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

$t = \sqrt{\frac{2\Delta y}{a}}$

$= \sqrt{\frac{2(-425\,m)}{-9.8\ \frac{m}{s^2}}}$

a) $\boxed{t = 9.31\,s}$

$v_{fy} = v_{iy} + at$

$= -9.8\ \frac{m}{s^2}(9.31\,s)$

b) $\boxed{v_{fy} = -91.3\ \frac{m}{s}}$

OR

$v_{fy}^2 = v_{iy}^2 + 2a\Delta y$

$= 2(-9.8\ \frac{m}{s^2})(-425\,m)$

$\boxed{v_{fy} = -91.3\ \frac{m}{s}}$

8° Honors Physics - Kinematics freefall quiz 5 09-30-02

A brick is dropped from a 475 m high cliff. (a) How long does it take to hit? (b) What is its final velocity?

$\Delta y = -475\,m$

$v_{iy} = 0\ \frac{m}{s}$

$a = -9.8\ \frac{m}{s^2}$

$t = ___\ s$

$v_{fy} = ___\ \frac{m}{s}$

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

$t = \sqrt{\frac{2\Delta y}{a}}$

$= \sqrt{\frac{2(-475\,m)}{-9.8\ \frac{m}{s^2}}}$

a) $\boxed{t = 9.85\,s}$

$v_{fy} = v_{iy} + at$

$= -9.8\ \frac{m}{s^2}(9.85\,s)$

b) $\boxed{v_{fy} = -96.5\ \frac{m}{s}}$

OR

$v_{fy}^2 = v_{iy}^2 + 2a\Delta y$

$= 2(-9.8\ \frac{m}{s^2})(-475\,m)$

$\boxed{v_{fy} = -96.5\ \frac{m}{s}}$