1. A student drops a stone from rest at the top of a well. She hears the stone splash into the water at the bottom of the well 2.3s after releasing the stone. Ignore the time taken for the sound to reach the student from the bottom of the well.

A) Calculate the depth of the well

B) Calculate the speed at which the stone hits the water surface.

1. a) $u = 0 \frac{m}{s}$

$t = 2.3 s$

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

$S = ut + \frac{1}{2}at^2$

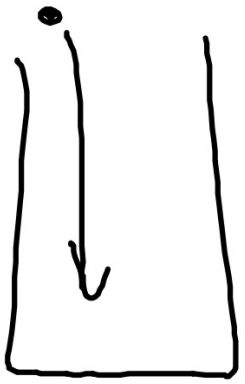
$u = 0$

$S = \frac{1}{2}at^2$

$S = \frac{1}{2}(-9.$

$S = -26$

2. b)



$t = 2.3\,s$

$u = 0\,\frac{m}{s}$

$a = -9.81\,\frac{m}{s^2}$

$V = u + at$

$u = 0$

$V = at$

$V = \left(-9.81\,\frac{m}{s^2}\right)$

$V = -23\,\frac{m}{s}$

2. The Flash starts running from a stand still. He reaches a final velocity of $3.7(10^9)$ $ms^{-1}$ after 0.96 s.

A) Calculate his acceleration.

B) What distance does he cover?

2. a) $V = 3.7(10^9)\frac{m}{s}$

$U = 0\frac{m}{s}$ $\quad a = ?$

$t = 0.96s$

$V = U + at$

$a = \frac{V-U}{t} = \frac{3.7(10^9)\frac{m}{s}}{0.96s} = 3.9($

2. b) $S = ?$ $V = 3.7(10^9)\frac{m}{s}$

$t = 0.965$ $u = 0\frac{m}{s}$

$$S = \frac{(V+u)t}{2}$$

$$S = \frac{\left(3.9(10^9)\frac{m}{s}\right)(0.965)}{2}$$

$S = 1.9(10^9)\,m$

3. An outfielder throws a baseball in a straight line (no impact of gravity) from 307 ft. to home. The ball leaves his hand at 103 mph.

A) How long does it take to reach home?

B) If the ball moves 0.074 in. in the catcher's mitt as it comes to rest, what was the acceleration?

3. a) $V = 103 \text{ mph}$

$S = 307 \text{ ft.}$

$$\frac{103 \text{ mi.}}{1 \text{ h}} \left| \frac{5280 \text{ ft.}}{1 \text{ mi.}} \right| \frac{1 \text{ h}}{3600 \text{ s}} = 151.0\overline{6}$$

$$V = \frac{\Delta S}{\Delta t} \quad t = \frac{\Delta S}{V} = 2.03$$

3. b) $U = 103\,mph \quad V = 0\,mp$

$S = 0.074\,in.$

$$\frac{0.074\,\cancel{in} \mid 1\,ft. \mid 1\,mi.}{\mid 12\,\cancel{in} \mid 5280\,ft} = 1.1$$

$$V^2 = U^2 + 2as$$

$$\frac{V^2 - U^2}{2s} = a \qquad \frac{-(103\,mph)^2}{2 \cdot 1.17(10^{-6})\,mi.} =$$