Friday, October 29

Warm Up

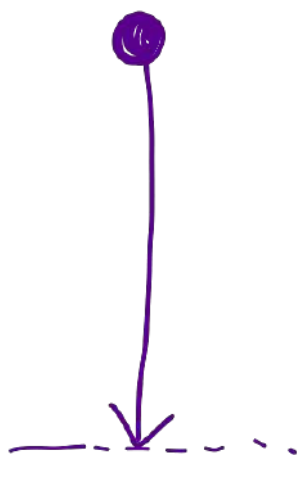
- A ball is dropped a building. Gravity is -9.81 m/s/s. It takes 0.78 seconds to hit the ground. Draw it out! What is the height of building?

Agenda

1. New Calendar
2. Vertical Kinematics
3. Exit Ticket
4. Practice Packet

Reminders

- Motion Basics and Kinematics Assessment **next Thursday.**



$a = -9.81\ m/s^2$

$t = 0.78\ sec$

$V_i = 0$

$d = ?$

$d = \cancel{V_i t} + \frac{1}{2} a t^2$

$d = \frac{1}{2}(-9.81)(0.78)^2$

$d = -3\ m$

Vertical Motion Basics

- acceleration is always gravity → $-9.81\ m/s^2$
- dropped → $V_i = 0$
- throw something down → V_i is negative
- V_f is not zero

Practice Problems (Going Down)

1. A ball is dropped from a building that is 110 m tall. What is the final velocity when it hits the ground? How long does it take to hit the ground?
2. The same ball is now thrown down with an initial velocity of 8 m/s. What is the final velocity when it hits the ground? How long does it take to hit the ground?

① $d = -110\,m$
$a = -9.81\,m/s^2$
$V_i = 0$
$V_f = ?$
$t = ?$

$V_f^2 = V_i^2 + 2ad$

$V_f^2 = 2(-9.81)(-110)$

$\sqrt{V_f^2} = \sqrt{2158}$

$V_f = \pm 46\,m/s$

$V_f = -46\,m/s$ (going down)

$V_f = V_i + at$ (can use 2nd equ. too!)

$-46 = (-9.81)t$

$t = 4.7\,sec$

② $d = -110\,m$
$a = -9.81\,m/s^2$
$V_i = -8\,m/s$
$V_f = ?$
$t = ?$

$V_f^2 = V_i^2 + 2ad$

$V_f^2 = (-8)^2 + 2(-9.81)(-110)$

$V_f^2 = 64 + 2158$

$\sqrt{V_f^2} = \sqrt{2222}$

$V_f = \pm 47\,m/s$

$V_f = -47\,m/s$

$V_f = V_i + at$

$-47 = -8 + (-9.81)t$

$+8 \quad +8$

$\frac{-39}{-9.8} = \frac{-9.8t}{-9.8}$

$t = 4\,sec$

Exit Ticket!!!!!
Turn it in to me :)

1. A person is running at 4 m/s at accelerates to 6 m/s over 7 seconds. What is their acceleration? What is the distance the travel when running?
2. A ball is dropped from your hands and dropped 1m. What is the time it took to hit the ground? What is the final velocity?