Projectile Motion

A.   A special case of 2-D motion in which the **only acceleration** is due to **<u>gravity</u>**.

> The acceleration vector is a constant. It points straight down with a magnitude of 9.8 m/s^2.

B.   Projectile motion can be broken down into **<u>two 1-dimensional motion problems</u>** <u>connected</u> by a

_____ _____ .

> The vertical motion is a Free Fall problem!!

> The horizontal motion is a constant speed problem!!

C. Important Information

1. Only the vertical component of a projectile's velocity is

_____ at the object's maximum height.

2. You should always break the initial velocity into components! You have no equations for vectors in polar form!

3. The trajectory of a projectile is a parabola and the velocity vector is always tangent to the path.

4. The horizontal component of the velocity is constant.

Example:
A golfer hits a golf ball with a speed of 75 m/s and an angle of 30 degrees with respect to the horizontal. Will the golf ball clear a 20 m high tree located 50 m from the ball?