FREE FALL AND PROJECTILE MOTION

Projectile motion is motion in two dimension:

- ➢ Horizontal

- ➢ Vertical

The horizontal component of projectile motion is always _____

The vertical component of projectile motion always experiences _____ due to _____

The horizontal displacement of a projectile is called _____

The vertical displacement of a projectile is its _____

When a projectile reaches its maximum height, its velocity is _____ only in the vertical

direction, its horizontal velocity remains _____ .

We assume that there are no forces acting on the object except the gravity, unless specifically mentioned otherwise, the

gravitational pull is the one of the Earth.

A projectile is an object that is launched and does not have any means of propelling.

NOTE: always include a sketch of the initial velocity vector and its decomposition.

Example 1: A ball is dropped from a height of 10 m. How long does it take to land?

Example 2: A ball is thrown horizontally from the height of 10 m with a velocity of 5.0 m/s. How long does it take to land? How far way does it land?

Example 3: An object is thrown from a height of 10 m with initial upward velocity of 3.0 m/s. How long does it take to land on the ground? What is its maximum height?

Example 4: An object is launched with an initial velocity of 20.0 m/s 30° above horizontal.

A) What is its maximum height?

B) How much time does the object spend in the air if it lands exactly at the same level it was launched from?

C) What is the object's final velocity if it lends 25.0 m below its launching point?