**Problem Set 2 (Due 3/18/2025 before class)**

**Late homework will NOT be accepted, unless you have notified the course instructor 3 days BEFORE deadline.**

**Part I (60%)**

文本

描述已自动生成

图片包含 图示

描述已自动生成

图片包含 图表

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**Part II (40%) Basic Problems**

1. An object accelerates uniformly from rest at a rate of 1.9 m/s2 west for 5.0 s. Find:

(a) the displacement

(b) the final velocity

(c) the distance traveled

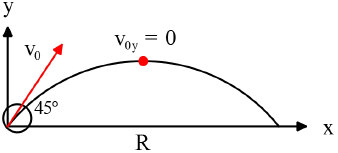
(d) the final speed

1. A 3.0 kg ball is thrown vertically into the air with an initial velocity of 15 m/s. What is the maximum height of the ball?
2. A window is 1.50 m high. A stone falling from above passes the top of the window with a speed of 3.00 m/s. When will it pass the bottom of the window? (Take the acceleration due to gravity to be 10 m/s2.)

A diagram of a height measurement

AI-generated content may be incorrect.

1. A ball is thrown horizontally from the roof of a building 50−m-tall and lands 45 m from the base. What was the ball’s initial speed?
2. A 1 kg projectile is fired from a cannon with an initial speed of 10m/s. The cannon has an elevation angle of 45◦. How far does the projectile go before striking the ground (neglect the air resistance)?



1. A bullet is fired horizontally from the top of a cliff which is 80m above a big lake. If the bullet muzzle (initial) speed is 400 m/s, how far from the bottom of the cliff does the bullet strike the surface of the lake? Neglect air resistance.

A graph of a function

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1. A rock is tossed at a 42° angle at an initial height of 1.2 m from the ground. 1.6 seconds after release, the rock reaches its maximum height. Find the initial velocity, the maximum height and the overall speed at maximum height.
2. A particle is moving at a constant speed in a circular trajectory centered on the origin of an x-y coordinate system. At one point (x = 4 m, y = 0 m) the particle has a velocity of -5.0 m/s. Determine the velocity and acceleration when the particle is at: (a) x = 0, y = -4 m. (b) x = -4 m, y = 0. (c) x = -2.83, y = 2.83 m.

A circle with a red line

AI-generated content may be incorrect.

1. A stunt pilot executes a uniform speed circular path in an airplane. The initial velocity (in m/s) of the plane is given by v = 2500+ 3000 m/s. One minute later the velocity of the plane is v = -2500 - 3000. Find the magnitude of the acceleration.
2. An 5−kg object moves around a circular track of a radius of 18 cm with a constant speed of 6 m/s. Find The magnitude and direction of the acceleration of the object.