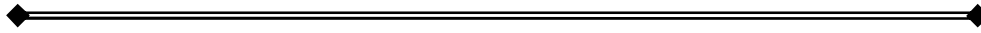


Projectile Motion

Name _____ Instructor's signature _____



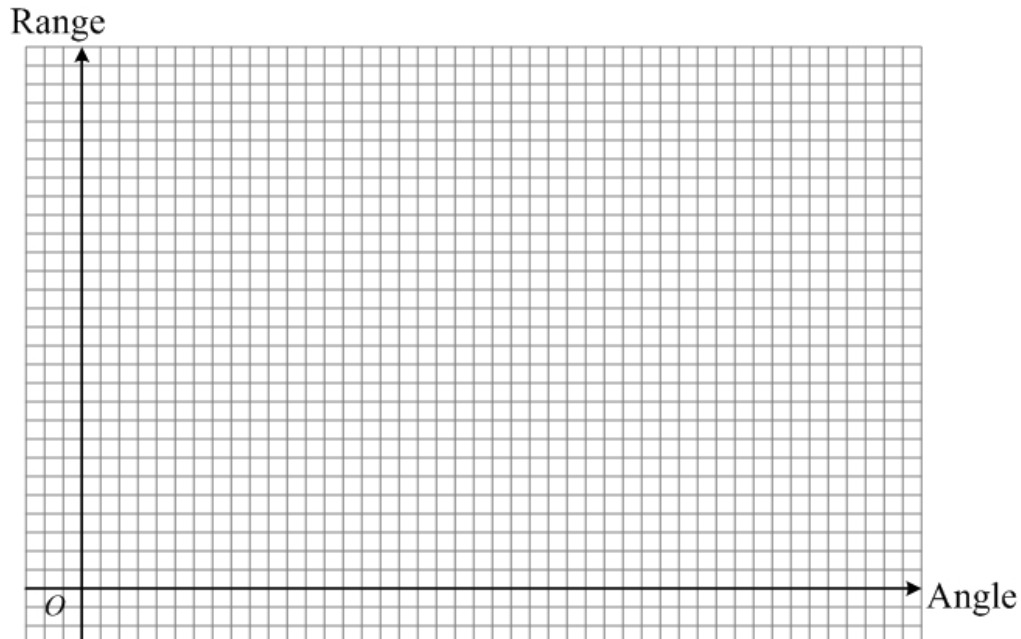
A projectile motion is a two dimensional kinematic motion. The motion is described with x - and y -directions separately. The initial velocity is in general angled and its x - and y - components have to be used to obtain the related values, such as the range and height. For this simulation, go at <http://hirophysics.com/Anime/projectile.html>.

1. Fixed initial velocity

Initial velocity $v_0 = 75.0$ () \leftarrow SI unit

Angle, (degrees)	20	40	45	50	55	60	80	90
$v_{x0} = v_o \cos \theta$								
$v_{y0} = v_o \sin \theta$								
Range (m) (from simulation)								
Max. height (m) (from simulation)								
\Downarrow Calculate the time with v_{x0} and the range. Check with your instructor.								
Time for flight								

Question 1: Plot a graph, R vs. θ .



Question 2: Which angle makes the maximum range? _____

Question 3: Which angle makes the maximum height? _____

Question 4: Which angle makes the maximum flight time? _____

2. Fixed angle

Angle $\theta = 45$ (degrees)

Initial velocity, v_0 (m/s)	30	40	50	60	70	80	90	100
$v_{x0} = v_o \cos \theta$								
$v_{y0} = v_o \sin \theta$								
Range (m) (from simulation)								
Max. height (m) (from simulation)								
\Downarrow Calculate the time with v_{x0} and the range. Check with your instructor.								
Time for flight								

Question 5: Describe the relationships, v_0 vs. range, v_0 vs. maximum height, and v_0 vs. flight time.

For the lab write up

- Write the introduction, conclusions and discussions.
- Refer to the questions above.
- Attach this sheet as the data.