Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period: \_\_\_\_\_\_

**KINEMATICS 2D: PROJECTILE MOTION AFTER QUIZ ACTIVITY**

**I. Answer the following. Show all your work. Use a=g=±10m/s2.**

**1. A football is kicked with an initial velocity of 55 m/s at an angle of 38‐degrees with the horizontal. Determine:**

a. the total time of flight [6.78s]

b. the horizontal distance [293.85m]

c. the peak height of the football. [57.46m]

**2. A cannon releases a cannonball at a velocity of 100m/s.**

a. What angle must a cannonball be fired at in order to have a time of flight of 16s? [53.13°]

b. What is the horizontal range? [960m]

**3. A projectile is launched at 55 degrees. It reaches its highest point in 20s. Find its initial velocity.** [244.15]

**4. A projectile is fired with an initial speed of 150m/s at an angle of 55˚ above the horizontal from the top of a cliff 100m high. Determine the**

1. Time to reach maximum height [12.53s]
2. Maximum height above the base of the cliff reached by the projectile [770.26]
3. Total time it is in the air [25.85s]
4. Horizontal range of the projectile [2224.44m]
5. Final velocity of the projectile (before it hits the ground) [156.33m/s]
6. Velocity of the projectile 2 sec after falling from max. height [88.23m/s]
7. Position of the projectile 2 sec after falling from max. height [1250m,750m]

100m

X

5. Use the trigonometric component method to determine the sum of following displacement vectors and the direction (with angle): A=6.0 m @ 40˚ NE, B=10.0m @ 50˚ NW, C=4.0 m @ 60˚ SW, D=10m E & E=5m N. [14.4m NE, Ɵ=64.59°]

E

B

A

D

C

**II. Answer the following**

1. The horizontal and vertical components of a projectiles velocity are \_\_\_\_\_\_\_\_\_\_\_ of each other.
   1. dependent
   2. independent
   3. similar
   4. the same as
2. The time it takes a projectile launched from the ground to reach maximum height is \_\_\_\_\_\_\_\_\_\_\_ the time it takes to go from maximum height back down to the ground.
   1. half
   2. the same as
   3. double
   4. independent of
3. The time it takes a projectile launched from the ground to reach maximum height is \_\_\_\_\_\_\_\_\_\_\_ the time it takes for the whole flight.
   1. half
   2. the same as
   3. double
   4. independent of
4. When you factor in air resistance, the projectile will travel \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
   1. higher, farther, and for greater time
   2. lower, shorter, and for less time
   3. shorter, but higher
   4. farther, but lower
5. The time of flight of a projectile depends upon the \_\_\_\_\_\_\_\_\_\_\_\_ initial velocity.
   1. x component of the
   2. y component of the
   3. horizontal component of the
   4. total
6. After 4 seconds, about how far down will a projectile fall if the initial velocity is zero.
   1. 1 meter
   2. 16 meters
   3. 20 meters
   4. 80 meters

7. The shape of a projectile’s trajectory is called a(n) \_\_\_\_\_\_\_\_\_\_\_\_\_.

a) arch

b) half circle

c) parabola

8. Examples of projectiles include \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

a) jet airplanes, powered rockets, helicopters

b) feathers, maple tree seeds, paper airplanes

c) fired bullets, launched rockets, thrown balls

d) all of the above

9. At the very top of a projectile’s path, its velocity is

a) entirely vertical

b) entirely horizontal

c) both vertical and horizontal

d) there is not enough information to tell

10. In the absence of air friction, the vertical component of a projectile’s velocity doesn’t change as the projectile moves.

a) always true

b) sometimes true

c) never true

11. In the absence of air resistance, the angle at which a thrown ball will have the greatest range is

a) 90 degrees

b) 60 degrees

c) 45 degrees

d) 30 degrees

e) 0 degrees

12. In the absence of air resistance, the angle at which a thrown ball will have the greatest height is

a) 90 degrees

b) 60 degrees

c) 45 degrees

d) 30 degrees

e) 0 degrees

13. When a projectile is affected by air resistance, the projectile will

a) not travel as far

b) not travel as high

c) all of the above

d) none of these

