1. What do the following stand for?

    Δy _____

    v_y _____

    Δt _____

    v_i _____

    θ _____

2. What equation would you use for the following?
    Hints:
    - Gravity is acceleration
    - $V_{y,f} = 0$ at the top of an arc
    - V_i can be turned into v_y and v_x

    a. Givens = Δt
       Looking for = $v_{y,f}$

    b. Givens = Δx
       Looking for = Δt

    c. Givens = v_i , θ, v_f
       Looking for = Δt

    d. Givens = Δy
       Looking for = $v_{y,f}$

3. A ball is launched from a tube with an initial velocity of 12 m/s at an angel of 35°. How long is the ball in the air? How far does the ball go?
    GIVENS   **DRAWING**

4. You jump your bike off of a ramp at an angle of 25°. If you land 1.5 meters away from the ramp, what is your initial speed?
   GIVENS   **DRAWING**

5. You are launching a cannon ball over a fence. If the fence is 74 meters high and you launch the cannon ball with an initial velocity of 18 m/s at an angle of 48°, what is the closest that you can be to the fence and still get the cannon ball over the fence?
   GIVENS   **DRAWING**

6. A ball rolls down a ramp and is launched at and angle of 14°. What is the balls hang time, maximum height, and range if the ball has a velocity of 1.24 m/s when it leaves the ramp?
   GIVENS   **DRAWING**

6.1 - 6.2 worksheet   Name _____-

1. ~~You are spinning a yo-yo above your head. If you are spinning the yo-yo with a velocity of 5.55 m/s and the yo-yo has an acceleration of 12 m/s², how long is the string? What is the tension of the string if the bucket has a mass of 1025 grams?~~

2. An apple is launched horizontally off a cliff on the moon with a velocity of 124 m/s. If the cliff is 210 m tall…
    HINT: the moons gravity is 1/6 the gravity of earths
    a. How long is the apple in the air?
    b. What is the final velocity of the apple?
    c. How far is the apple from the base of the cliff?

3. You throw a ball into a target that is 31.5 meters away (the target is at shoulder height). If you throw the ball with an initial angle of 40°, what is the initial speed? What is the highest point the ball reaches.

4. A ball is launched with an initial velocity of 12.66 m/s at an angle of 28° North of East.
    a. How long is the ball in the air?
    b. How far does it go?
    c. How high does it go?

5. A plane traveling at 100 m/s drops a box 478 meters to the ground.
    a. What horizontal distance does the box travel before it his the ground?

6. You are running a race when you come up to the last curve in the track. What is your velocity if you have a centripetal acceleration of 1.5 m/s² and the track has radius of 12 meters?

7. You spin a top as fast as you can and determine that the top is making 14 revolutions per second. What is the centripetal acceleration of the top if the top has a diameter of 7 cm?

8. You shoot a cannon ball out of a cannon with an initial speed of 82 m/s. If the cannon is sitting at a 47°, will the cannon ball clear a 185 meter high fence? If so, how far will it go?

9. **Challenge:** You throw a rock off of a 24 meter high cliff with a velocity of 28 m/s with an angle of 67°. How long is the rock in the air? How far does the rock travel?