

Assignment projectile motion Physics 105 + REVIEW FOR QUIZ !! so DO IT x-(

part1:

1. A velocity is $V = 30\text{ m/s}$ @ 25 degrees above horizontal

Find the x-component $V_x =$ _____

Find the y-component $V_y =$ _____

sketch

2. A velocity V_0 has the components : $V_{ox} = 10\text{ m/s}$ and $V_{oy} = -20\text{ m/s}$

sketch

Find the magnitude $V =$ _____ m/s and the direction = _____ degrees above horizontal

So $V =$ _____ m/s @ _____ degrees

part2:

1. An object is thrown horizontally with an initial speed of $V_{ox} = 10\text{ m/s}$.

How far it will drop in 4 seconds? (find the vertical displacement Y)

2. From a height of 100m, a ball is thrown horizontally with an initial speed of $V_{ox} = 15\text{ m/s}$.

How far it travels horizontally in the first 2 seconds. (solve for the X displacement)

3. A projectile is traveling in a parabolic path for a total of 6s. How does its horizontal velocity 1 s after launch compared to its horizontal velocity after 4s after launch ?

4. A ball rolls off a tabletop with an initial velocity of 3 m/s (V_{ox}) . If the tabletop is 1.25m ($y = -1.25\text{ m}$) above the floor,

a) How long does it take for the ball to hit the floor ? ($V_{oy} = 0$)

b) How far does the ball travel horizontally ? (solve for X)

5. An object is projected upward with a 30 degrees launch angle and an initial speed of $V_0 = 40\text{ m/s}$.

Find the x-component of the initial velocity V_{ox}

Find the y-component of the initial velocity V_{oy}

How long will it take for the object to reach the top of its trajectory (at the top $V_y = 0\text{ m/s}$) ?

How high is this ?

5. An object is projected with a 30 degree launch angle and an initial speed of $V_0 = 60$ m/s.

$$V_{ox} = \quad \quad \quad V_{oy} =$$

How many seconds will it be in the air ? How far will it travel horizontally ?

6. Divers is Acapulco dive from a cliff that is 61 m ($y = -61$) high.

If the rocks below the cliffs extend outward for 23m ($x = 23$ m)

what is the minimum horizontal velocity (V_{ox}) a diver must have to clear the rocks ?

7. A dart player throws a dart horizontally at a speed of 12.4 m/s (V_{ox})

The dart hits the board 0.32m ($y = -0.32$) below the height from which it was thrown.

How far away is the player from the board ? (solve for the horizontal displacement X)

8. After a bad grade in Physics you throw my Physics book horizontally at $V_{ox} = 8.0$ m/s from a cliff

64m high ($y = -64$). You calm down and you need your book back. (too late to drop the class ;-)

How far from the base of the cliff should you look for the book ? (solve for X)

9. A meteorite is being tracked by radar as it falls through the Earth atmosphere.

When its altitude is 30,000m , the radar screen shows that the meteorite is traveling with a velocity of 583 m/s at an angle of 28.3 degrees below the horizontal.

Sketch

$$V_{ox} =$$

$$V_{oy} =$$

How much time elapsed before the meteorite strikes the earth ? ($y = -30,000$)

What is the velocity (magnitude and direction) of the meteorite before impact with the earth ? HINT:

first find the final x-component V_x

find the final y-component V_y

Find the magnitude V and the direction $V =$ _____ m/s @ _____ degrees

Use $\tan(\theta) = V_y/V_x$