Test Review

Basic Projectile Motion Equations

Launched horizontally

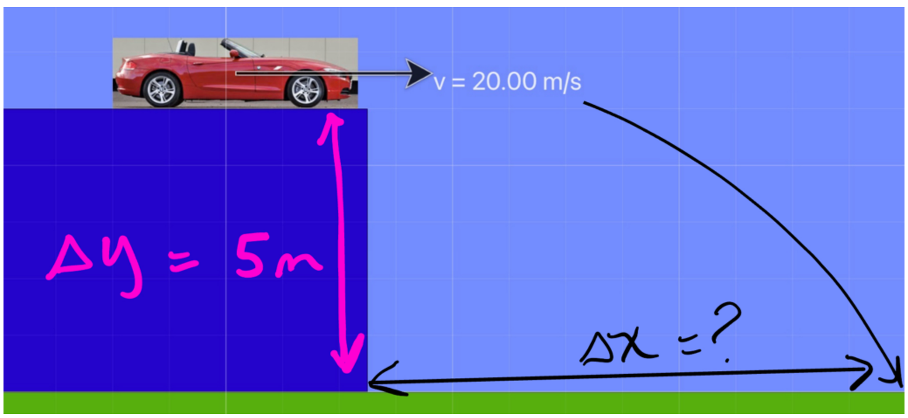
Vertical motion: $\Delta y = 5t^2$ or t = square root of $\Delta y/5$

Horizontal motion: $\Delta X = vt$ or $v = \Delta X/t$

Launched at an angle

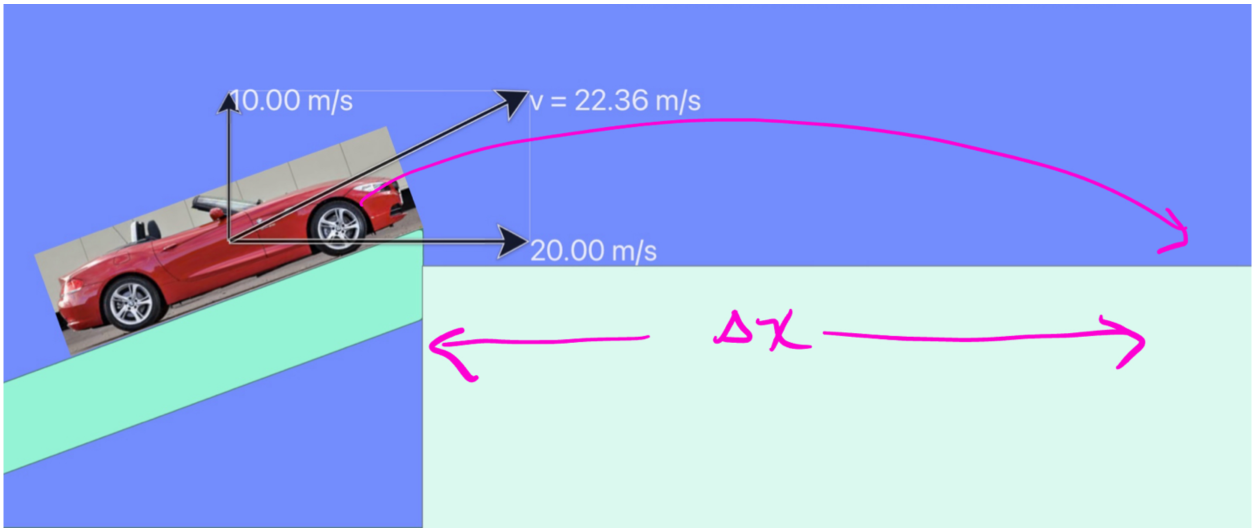
Vertical motion: total time in air $t = v_y/5$

Horizontal motion: $\Delta x = v_x t$ or $v_x = \Delta x/t$



1. A BMW Z4 drives horizontally off a 5-meter-high building with an initial speed of 20 m/s. How far away from the building does it land?
    a. 10 m
    b. 15 m
    c. 20 m

A BMW Z4 drives off a ramp with an initial vertical velocity of 10 m/s and horizontal velocity of 20 m/s

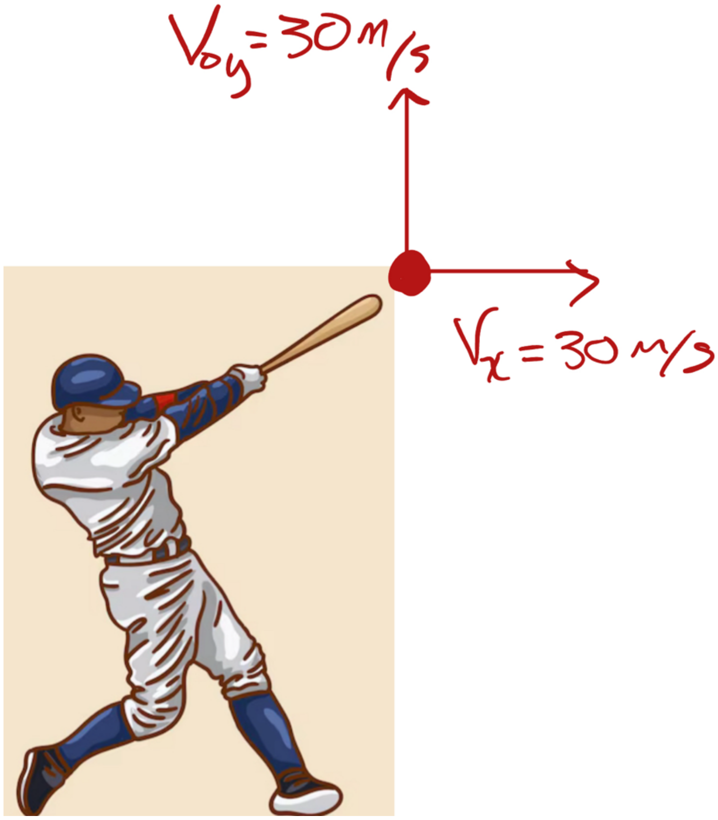


2. Which velocity component changes?
    a. The vertical velocity
    b. The horizontal velocity
    c. They both change

3. How long is this car in the air?
    a. 1 second
    b. 2 seconds
    c. 3 seconds

4. How far away does the car land?
    a. 10 meters
    b. 20 meters
    c. 40 meters

5. What is the acceleration of the car while it is in the air?
    a. 10 m/s/s down
    b. Zero

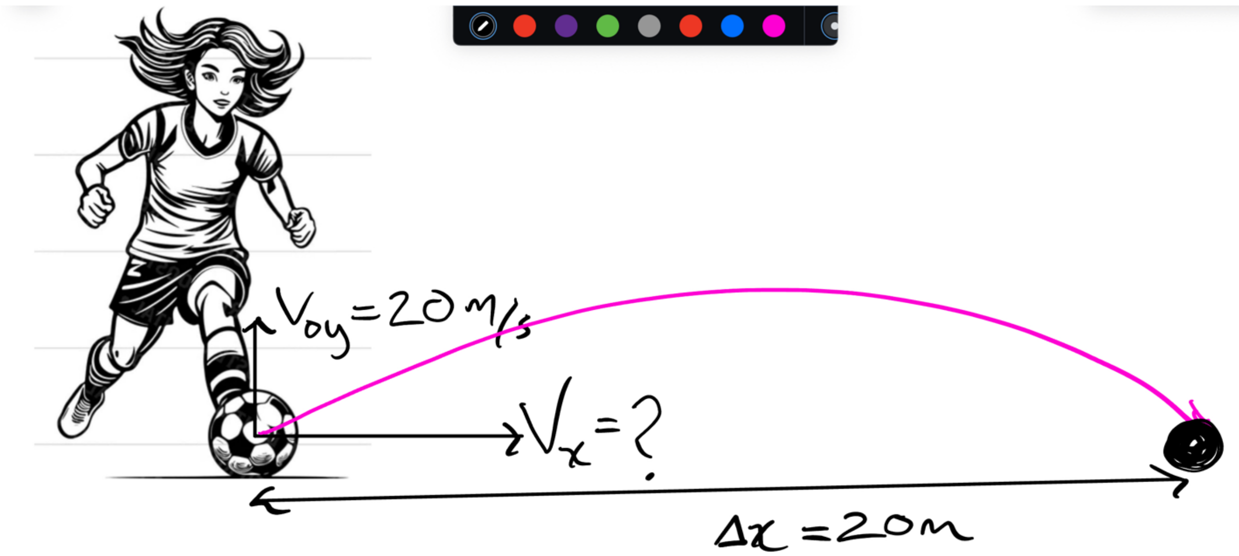


This guy hits a baseball, giving it an initial vertical velocity of 30 m/s and horizontal velocity of 30 m/s.

6. What total time is the ball in the air?
    a. 3 seconds
    b. 6 seconds
    c. 10 seconds

7. How far away will the ball land?
    a. 30 m
    b. 90 m
    c. 180 m

8. What is the ball's acceleration while it is in the air?
    a. Zero
    b. 10 m/s/s down



This girl kicks a soccer ball ⚽ giving it an initial vertical velocity of 20 m/s. The ball lands 20 meters away.

9. What total time is the ball in the air?
    a. 2 seconds
    b. 3 seconds
    c. 4 seconds

10. What was the horizontal velocity of the ball?
    a. 5 m/s
    b. 10 m/s
    c. 20 m/s