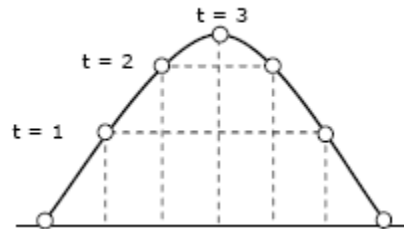


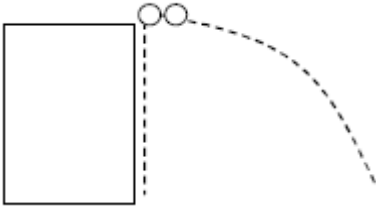
Projectile Review

1. Make a chart showing the vertical and horizontal velocity of the projectile from $t = 0$ to $t = 6$ sec.



$$V_{ix} = 10 \text{ m/s} \quad V_{iy} = 30 \text{ m/s}$$

- 1a) How does gravity change a projectile's vertical motion on the way up to the peak.
- 1b) A projectile's vertical velocity at the peak is always _____.
- 1c) How does gravity affect the vertical velocity of a projectile after an object passes the peak?
- 1d) What is the vertical acceleration of this ball?
- 1e) What is the horizontal acceleration?
2. A projectile takes 2 seconds to reach the peak of its parabolic path, what is the total time it spends in the air?
3. How should you aim at a target when you know it's going to fall when you shoot?
4. If an object is **projected horizontally** at 1000 m/s, what is V_{iy} and V_{ix} ? (no trig is needed for this one)
- $V_{iy} = \underline{\hspace{2cm}}$ $V_{ix} = \underline{\hspace{2cm}}$
5. What is the vertical component of a soccer ball's velocity if it is kicked at a speed of 10 m/s and an angle of 60 degrees? (see equation sheet - trig.)
6. What is the horizontal component? (see equation sheet)
7. An object is dropped off a cliff and at the same time a second ball is **projected horizontally at 10 m/s**.



Compare the following for each object:

- a) time spent in air before hitting the ground
- b) vertical height of both objects (show this in your drawing)
- c) horizontal displacement (dx)
- d) vertical acceleration

8. In the previous question, what is the horizontal velocity of the second ball when it hits the ground.

9. A 10 kg object and a 100 kg object are dropped simultaneously from the same height. Compare each object's:

- a) height at any point in time _____ b) time each spends in the air

- c) vertical velocity at any point in time _____

- d) vertical acceleration at any point in time _____