

Flight of a Projectile

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Name: _____

Period: _____

A projectile's height is defined by: $h(t) = -16t^2 + v_0t + h_0$, where v_0 is the initial velocity (ft/sec) and h_0 is the initial height (feet). Use the given information to (a) sketch a diagram, (b) write an equation, (c) locate the highest point of the projectile and (d) calculate the time at which the projectile hits the ground. Use [MATHguide's online lesson](#) for help.

- 1) Jorge was standing at ground level and said he threw a ball straight up into the air at 250 feet/sec.
- 2) Luis had a pet rock, named Radwin. He tossed Radwin up from a 100 foot hill at 30 feet/sec.
- 3) Frank had an ant farm. His largest ant was named Raphael. Maria took Frank's ant farm on top of Willis Tower, which is 1451 feet high. Raphael escaped from the farm and fell. [Raphael wasn't injured because ants, like all insects, can fall from great heights without any harm.]
- 4) Jackie whipped a softball to Jessica. The ball was traveling upwards at 60 ft/sec and Jackie was standing on a hill, 20 feet above ground level.
- 5) Yenia had a rubber ball and threw it over the side of a building. It was traveling upwards at 40 ft/sec and the top of the building was 30 floors tall (each floor was ten feet).
- 6) Tina was standing on The Sunshine Highway Bridge in Florida. [If you are ever near St. Petersburg, FL, you must travel across this beautiful bridge.] She was 200 feet above the ocean and released a dead fish.
- 7) Daniela threw a tennis ball to Naquesha going up at 90 ft/sec. Naquesha was standing at the window of a building 80 feet high. How long did it take for the ball to reach Naquesha? There are two possible answers. Find both answers.

Extra Credit: Change the initial upward velocity of Jorge's ball from feet/sec to miles/hour to determine if Jorge's story sounds accurate.