



3. A rocket is launched from atop a 101 – foot cliff with an initial velocity of 116 ft/s.
- Substitute the values into the vertical motion formula  $h(t) = -16t^2 + vt + h_0$ . Let  $h(t) = 0$
  - Use the quadratic formula to find out how long the rocket will take to hit the ground after it is launched. Round to the nearest tenth of a second.
4. You and a friend are hiking in the mountains. You want to climb to a ledge that is 20 ft. above you. The height of the grappling hook you throw is given by the function  $h(t) = -16t^2 - 32t + 5$ . What is the maximum height of the grappling hook? Can you throw it high enough to reach the ledge?
5. You are trying to dunk a basketball. You need to jump 2.5 ft. in the air to dunk the ball. The height that your feet are above the ground is given by the function  $h(t) = -16t^2 + 12t$ . What is the maximum height your feet will be above the ground? Will you be able to dunk the basketball?
6. A diver is standing on a platform 24 ft. above the pool. He jumps from the platform with an initial upward velocity of 8 ft/s. Use the formula  $h(t) = -16t^2 + vt + s$ , where  $h$  is his height above the water,  $t$  is the time,  $v$  is his starting upward velocity, and  $s$  is his starting height. How long will it take for him to hit the water?