

1. A car goes from 30 kph to 80 kph in 20 seconds. What is its acceleration and how far does it move during that time? $[0.694 \text{ m/s}^2, 304.9 \text{ m}]$

2. A ball is thrown up vertically in the air at a speed of 5 m/s. How high does it go and how fast will it move when it comes back to its initial height? $[\Delta S = 1.28 \text{ m}, -5.0 \text{ m/s}]$

3. How many "gravities" can a rocket produce if it accelerates horizontally from 0 to 1600 km/h in 1.8 seconds? $[25.2 \text{ g's}]$ What distance will it cover during that time? $[400.0 \text{ m}]$

4. Write a word problem with the following data : $\Delta s = 10 \text{ m}$.

$$v = 10 \text{ m/s} \quad a = 5 \text{ m}\cdot\text{s}^{-2} \quad v_0 = ? \quad t = ?$$

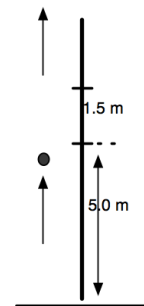
and solve it!

5. A ball is dropped into a lake from 10 m above the lake surface. Upon hitting the water the speed of the shoe is reduced by half and the shoe then sinks at a constant speed. If it reaches the bottom 4.0 seconds after it was dropped, how deep is the lake? $[19.6 \text{ m}]$

6. In the problem above, assume the lake has been drained and the ball is thrown from the same point and reaches the bottom of the lake at the same time. What is its initial velocity? $[+12.2 \text{ m/s}]$

7. Two balls are shot upward from the same point two seconds apart. If the initial velocity is 15 m/s, where and when do they collide? $[6.58 \text{ m above the ground}, .53 \text{ s after the second ball is shot}]$

8. A ball is thrown straight up and falls straight down. On its way up it passes the length your window (1.5 m) in 0.35s. Determine the initial velocity and the highest point that the ball reached if the window is 5.0 m above the point where the ball was thrown. $[V_0 = 11.6 \text{ m/s upward}]$



9. A ball is dropped from the roof of a building. When it hits the ground at 52 m below, it bounces up with a velocity 40% less than its fastest velocity down. If the ball is caught at the highest point after the bounce:

- How high does the ball travel after the bounce?
- What is the total time before the ball is caught?