

4. The graph shows the velocity vs. time for a rolling ball.

a. Describe how the ball is moving.

b. $-2 \frac{m}{s^2}$ away & slowing

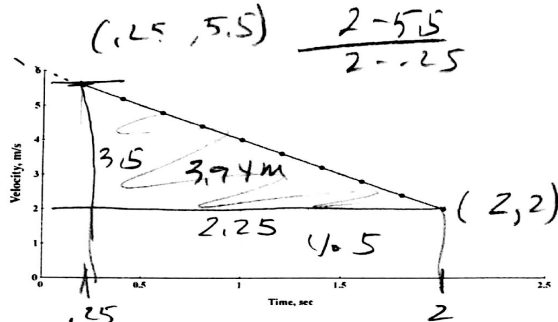
c. $5.5 \frac{m}{s}$ on graph or $v = 6$ at $t = 0$

d. $v = 6 - 2t$ Write a general equation for the ball's velocity using the starting velocity and acceleration. $v = v_0 + at$

e. $2 \frac{m}{s}$ How fast would the ball be moving at the 2.0 seconds? $v = 6 - 2(2) = 2$

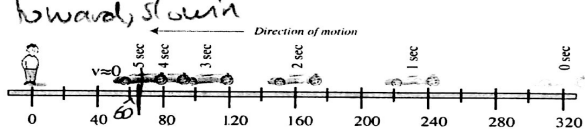
f. 3 sec Calculate the time when the ball will stop. $0 = 6 - 2t$

g. $\sim 8.1 \text{ m}$ Calculate the ball's total displacement for the data shown.



5. The changing positions of a car shown in the picture.

a. $v = 0, x_0 = 320 \text{ m}$ times moving toward, slowing Identify the values that are given.



b. Describe the motion shown.

c. -255 m moving toward observer & slowing Estimate the car's displacement. $\Delta x = 65 - 320 = -255$

d. $-51 \frac{m}{s}$ Calculate the average velocity of the car from 0 to 5 seconds. $v_{avg} = \frac{\Delta x}{\Delta t} = \frac{-255}{5} = -51 \frac{m}{s}$

e. $20 \frac{m}{s^2}$ Calculate the acceleration of the car. $v = v_0 + at$ $0 = 102 + a(5) - 102 = v_0$ $v_0 = ?$ $v_{final} = 0$ $v_{avg} = \frac{v_1 + v_2}{2}$ $-51 = \frac{v_0 + 0}{2}$ **Assume a const**

6. A pumpkin is thrown directly upward with an initial velocity of 19.6 m/s.

a. $x_0 = 0, v_0 = 19.6, a = -9.8, v_{top} = 0, t = ?$ Identify the known values for this situation. (x, x_0, v, v_0, a, t)

b. 2 sec How much time will it take for the pumpkin to reach its maximum height?

c. 19.6 m How high will the pumpkin get?

$$v = v_0 + at$$

$$0 = 19.6 + (-9.8)t$$

$$2 = t$$

$$x = \frac{1}{2}at^2 + v_0t + x_0$$

$$= \frac{1}{2}(-9.8)(2)^2 + 19.6(2) + 0$$