

3. How far does the car travel between 1.7s to 3.5s?

$$v_0 = 6.7$$

$$\Delta t = 1.8$$

$$a = 13.9 \text{ m/s}^2$$

$$\Delta x = v_0 t + \frac{1}{2} a t^2$$

$$= 6.7(1.8) + \frac{1}{2}(13.9)(1.8^2)$$

$$= 14.3 \text{ m}$$

4. After the race the driver, in his excitement, throws his helmet straight up at 4.7m/s, releasing it from a height of 1.6m.

- a. When does the helmet land?

$$v_0 = 4.7 \text{ m/s}$$

$$y_0 = 1.6 \text{ m}$$

$$g = -9.8$$

$$y = 0 \text{ m}$$

$$t = ?$$

$$y = v_0 t + \frac{1}{2} g t^2$$

$$0 = 1.6 + 4.7t + (-4.9)t^2$$

$$t = 1.23 \text{ s}$$

- b. What is the helmet's highest point above the ground?

$$v = 0 \text{ m/s}$$

$$v_0 = 4.7 \text{ m/s}$$

$$y = ?$$

$$v^2 = v_0^2 + 2g y$$

$$v^2 - v_0^2 = 2g y$$

$$y = \frac{v^2 - v_0^2}{2g} = \frac{0 - 4.7^2}{-19.6} = 1.12$$

$$+ 1.6$$

$$= 2.72 \text{ m}$$

- c. How fast is it moving when it lands?

$$v = 4.7 + (-9.8)(1.23)$$

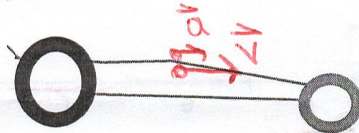
$$= -7.35 \text{ m/s}$$

- d. Is the helmet's distance traveled or displacement greater?

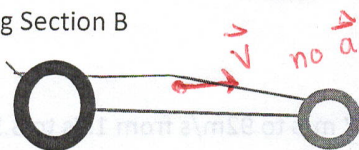
5. Does the driver's speedometer register average speed or instantaneous speed? Explain how you know.

6. Draw the velocity and acceleration vectors for the car

- a. During Section A



- b. During Section B



- c. During Section D

