

4. After seeing a Tigers game in Detroit, you get onto I-94 toward Ann Arbor at 10:00 pm. On I-94, you run into a few pockets of traffic. Glancing at the speedometer occasionally, you note your speed fluctuates as in the table below.

minutes after 10:00	0	5	10	15	20	25	30
speed (mph)	50	71	65	42	35	70	74

- (a) (4 points) Using the information given, estimate your acceleration at 10:10. Be sure to include units.

$$\text{accel}(10) \approx \frac{\text{speed}(10:15) - \text{speed}(10:05)}{10:15 - 10:05} = \frac{42 - 71 \text{ mph}}{10 \text{ min}}$$

$$= \boxed{-2.9 \text{ mph/min}}$$

- (b) (6 points) Approximately how far from your entrance onto I-94 are you at 10:30? Be certain to show how you arrived at your approximation, and again, give correct units.

$$\begin{aligned} \text{LHS} &= 5 \text{ min} [50 + 71 + 65 + 42 + 35 + 70] \text{ mph} \cdot \frac{1 \text{ hr}}{60 \text{ min}} \\ &= \frac{5}{60} [313] \text{ miles} = 27.75 \\ \text{RHS} &= \frac{5}{60} [71 + 65 + 42 + 35 + 70 + 74] \text{ miles} \\ &= 29.75 \text{ miles} \end{aligned}$$

So you have gone approximately $\boxed{28.75 \text{ miles}}$