

TICKER TIMER PROBLEMS

What is the average velocity of the following ticker timer tapes?



$$s = 10.7 \text{ cm}$$

$$t = 6 \times 0.02 = 0.12 \text{ s}$$

$$v = \frac{s}{t} = \frac{10.7}{0.12} = 89.2 \text{ cm/s}$$

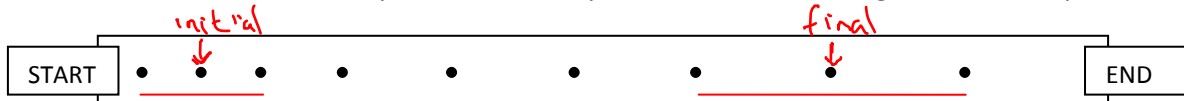


$$s = 11.8 \text{ cm}$$

$$t = 4 \times 0.02 = 0.08 \text{ s}$$

$$v = \frac{s}{t} = \frac{11.8}{0.08} = 147.5 \text{ cm/s}$$

What is the initial velocity and final velocity of each of the following ticker timer tapes?



$$s = 1.5 \text{ cm}$$

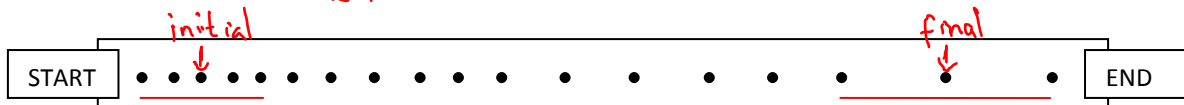
$$t = 0.04 \text{ s}$$

$$s = 3.6 \text{ cm}$$

$$t = 0.04 \text{ s}$$

$$\text{initial velocity} = \frac{s}{t} = \frac{1.5}{0.04} = 37.5 \text{ cm/s}$$

$$\text{Final velocity} = \frac{s}{t} = \frac{3.6}{0.04} = 90 \text{ cm/s}$$



$$s = 1.6 \text{ cm}$$

$$t = 0.08 \text{ s}$$

$$s = 2.8 \text{ cm}$$

$$t = 0.04 \text{ s}$$

$$\text{initial velocity} = \frac{s}{t} = \frac{1.6}{0.08} = 20 \text{ cm/s}$$

$$\text{Final velocity} = \frac{s}{t} = \frac{2.8}{0.04} = 70 \text{ cm/s}$$

What is the acceleration of the last two ticker timer tapes?

* 1st Ticker Timer Tape

$$v = 90 \text{ cm/s}$$

$$u = 37.5 \text{ cm/s}$$

$$t = 6 \times 0.02 = 0.12 \text{ s}$$

$$a = \frac{v-u}{t} = \frac{90-37.5}{0.12}$$

$$= 437.5 \text{ cm/s}^2$$

* 2nd Ticker Timer Tape

$$v = 70 \text{ cm/s}$$

$$u = 20 \text{ cm/s}$$

$$t = 14 \times 0.02 = 0.28 \text{ s}$$

$$a = \frac{v-u}{t} = \frac{70-20}{0.28} = 178.6 \text{ cm/s}^2$$