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Electric Car racing stats

hedra.com

1/4 mile track 0.25 miles

conversion

"Rocket" $t = 6.940$ s

speed = 201.37 mph

May 4 2012

1 mile = 1.60934 km $\quad \frac{1.60934 \text{ km}}{\text{mile}}$

$\frac{1}{4}$ km: $0.25 \text{ mile} \times 1.60934 \frac{\text{km}}{\text{mile}}$

$= 0.402335$ km

$\frac{1}{4}$ m: $0.402335 \text{ km} \times 1000 \frac{\text{m}}{\text{km}}$

$= 402.335$ m

201.37 mph

$\frac{1}{4}$ km/h = $\frac{1}{4}$ mile per hour $\times 1.60934 \frac{\text{km}}{\text{mile}}$

$= 201.37 \frac{\text{mile}}{\text{hour}} \times \frac{1.60934 \text{ km}}{1 \text{ mile}} = 324.0 \frac{\text{km}}{\text{h}}$

$$\frac{m}{s} = 324.0 \frac{km}{h} \times \frac{1000\ m}{1\ km} \times \frac{1\ h}{3600\ s}$$

$$= 90.00 \frac{m}{s}$$

Which formula works?

$$v = \frac{\Delta d}{\Delta t} \qquad \vec{\Delta d} = \frac{(\vec{v}_i + \vec{v}_f)}{2} \Delta t$$

$$\vec{a}_{av} = \frac{\vec{v}_f - \vec{v}_i}{\Delta t} \qquad \Delta \vec{d} = \vec{v}_i \Delta t - \frac{\vec{a}(\Delta t)^2}{2}$$

$$\vec{\Delta d} = \vec{v}_i \Delta t + \frac{\vec{a}(\Delta t)^2}{2}$$

$\vec{v}_i = 0 \frac{m}{s}$ - starting from standing still

$E_k = \frac{mv^2}{2}$ - need mass of vehicle

For calculating acceleration

$$\vec{a}_{av} = \frac{\vec{v}_f - \vec{v}_i}{\Delta t}$$

$$= \frac{90.00 \frac{m}{s} - 0.00 \frac{m}{s}}{6.90 s}$$

$$= 13.0 \frac{m}{s^2}$$