Today!

Finish Chapt 1
(overview)

Chapt 2:
motion

Chapt 3:
vectors

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§ 1.5 - Acceleration

$$\vec{a} \equiv \frac{\Delta \vec{v}}{\Delta t} = \frac{\Delta}{\Delta t}\left(\frac{\Delta \vec{r}}{\Delta t}\right)$$

$\vec{a} \neq 0$ if magnitude and/or direction of $\vec{v}$

changes

§1.6 - Motion Diagrams

not much to add

Projectile:

§1.7 - Words to Symbols

Tactics Box 1.4

- read

§1.8 - Problem Solving

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1. Model (already discussed)
2. Visualise
3. Guess.
4. Solve

   If numeric, put in numbers last.

5. Assess

Example:

Barrie is 90 km North of TO

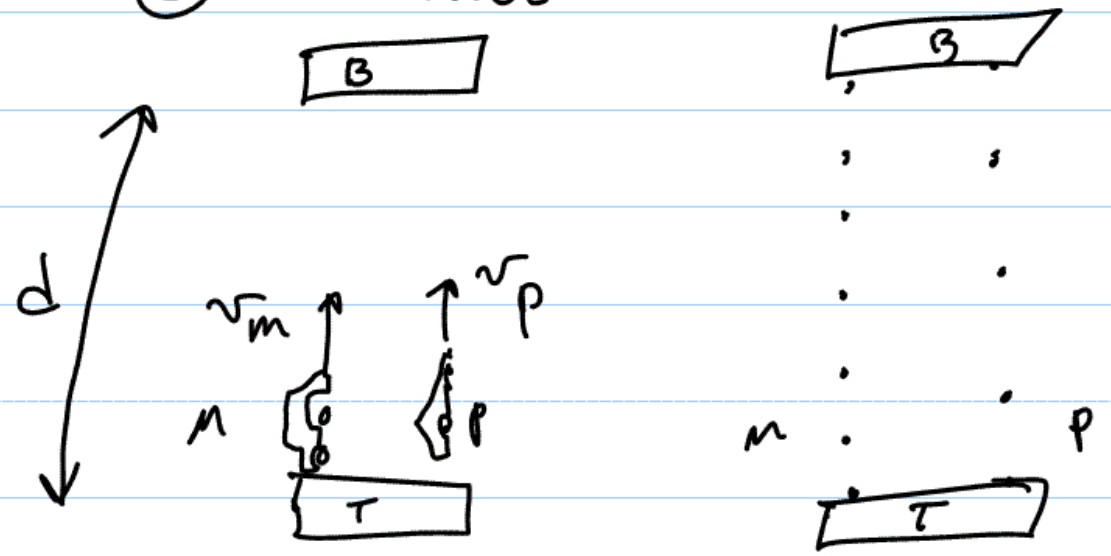
Mathematician: from TO to Barrie
100 km/hr
5 stops.

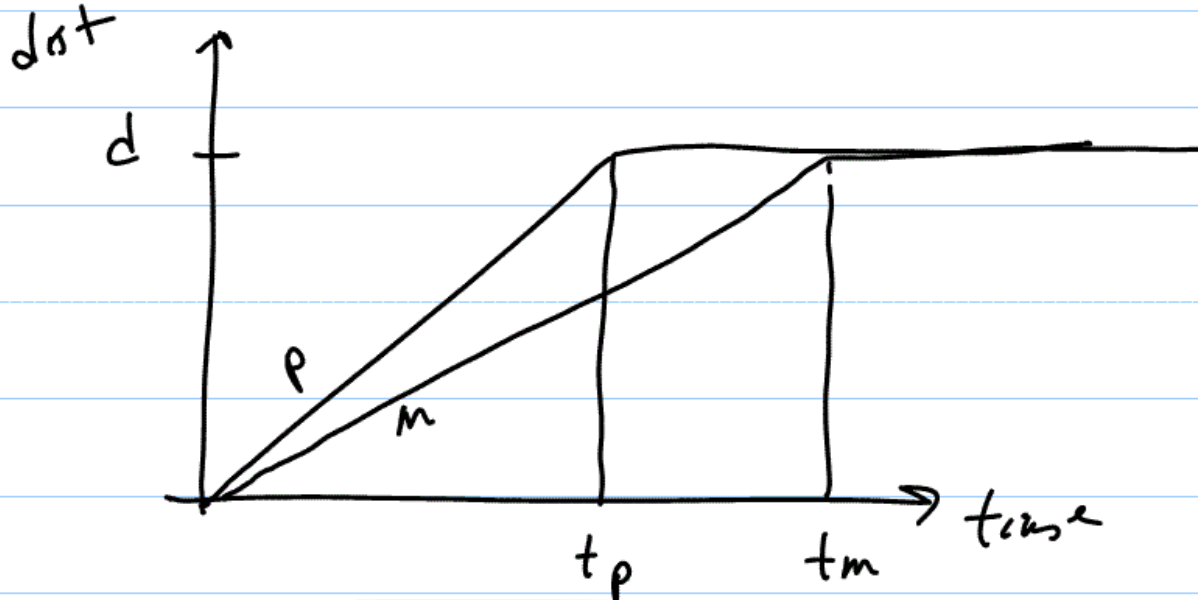
Physicist: from TO to Barrie
125 km/hr
5 stops

Leave at same time
How long does physicst wait for mathematician?

① Guess! ~10 minutes

② Visualise





answer $t_m - t_p$

$$d = v_m t_m \qquad t_m = \frac{d}{v_m}$$

$$d = v_p t_p \qquad t_p = \frac{d}{v_p}$$

$$t_m - t_p = d\left(\frac{1}{v_m} - \frac{1}{v_p}\right)$$

$$= 90\,\text{km}\left(\frac{1}{100\,\text{km/hr}} - \frac{1}{125\,\text{km/hr}}\right)$$

$$= 0.18\ \text{hr} = 11\ \text{mins}$$

Assess

§ 1.9 Units & Sig Figs

coming Nov 2

CHAPT 2

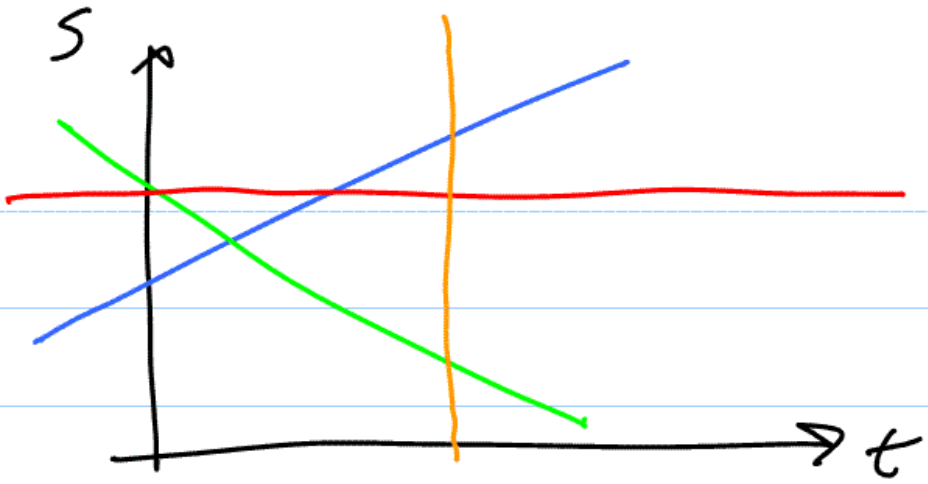
Math of Motion

§2.1 – posn-time graphs

§2.2 – Uniform Motion

= displacements in
= time

NB! "generic axis" 5



§2.3 - Inst Velocity

$$\vec{v}_{avg,s} = \frac{\Delta \vec{s}}{\Delta t}$$

$$\vec{v}_{inst,s} = \lim_{\Delta t \to 0} \frac{\Delta \vec{s}}{\Delta t} = \frac{d\vec{s}}{dt}$$

§2.8 - Inst Accel

$$\vec{a}_{avg,s} = \frac{\Delta \vec{v}}{\Delta t} = \frac{1}{\Delta t}\left(\frac{\Delta \vec{s}}{\Delta t}\right)$$

$$\vec{a}_{inst,s} = \lim_{\Delta t \to 0} \frac{\Delta \vec{v}}{\Delta t} = \frac{d\vec{v}}{dt}$$

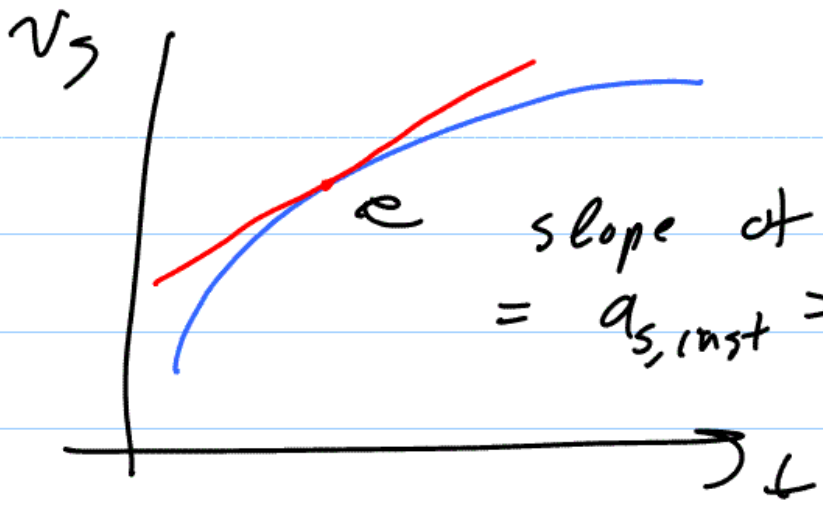
$$= \frac{d^2 \vec{s}}{dt^2}$$

Combine §2.4 & §2.5

tangent!

slope = $v_{inst,s}$

$$= \frac{dv_{inst,s}}{dt}$$



slope of tangent
$= a_{s,inst} = \frac{dv_s}{dt}$

$s \Rightarrow v \Rightarrow a$

slopes - derivatives

$a \Rightarrow v \Rightarrow s$

areas under curves

integrals