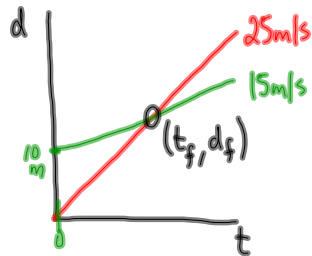


Chase ProblemsRed Car: $\vec{v} = 25\text{m/s}[\text{R}]$ and $\vec{d}_i = 0\text{m}$ Green Car: $\vec{v} = 15\text{m/s}[\text{R}]$ and $\vec{d}_i = 10\text{m}[\text{R}]$

Where and when will the Red car pass the green car?

Red Car

$$v = \frac{\Delta d}{\Delta t}$$

$$\Delta d = v \Delta t$$

$$d_f - d_i = v(t_f - t_i)$$

$$d_f - 0 = \left(\frac{25\text{m}}{\text{s}}\right)(t_f - 0)$$

$$d_f = \left(\frac{25\text{m}}{\text{s}}\right) t_f$$

$$y = mx + b$$

Green Car

$$\Delta d = v \Delta t$$

$$d_f - d_i = v(t_f - t_i)$$

$$d_f - 10\text{m} = (15\text{m/s})(t_f - 0)$$

$$d_f - 10\text{m} = (15\text{m/s}) t_f$$

$$d_f = (15\text{m/s}) t_f + 10\text{m}$$

$$y = mx + b$$

Set d_f for the Red Car equal to d_f for Green car

$$25t_f = 15t_f + 10$$

$$10 \frac{t_f}{\text{m/s}} = 10\text{m}$$

$$t_f = 1\text{s}$$

On 1s the Red car will have caught up with the green car.

$$d_f = (25\text{m/s}) t_f$$

$$d_f = (25\text{m/s})(1\text{s})$$

$$d_f = 25\text{m}$$

$$\vec{d}_f = 25\text{m}[\text{R}]$$

The cars will be 25m [R] of the origin.