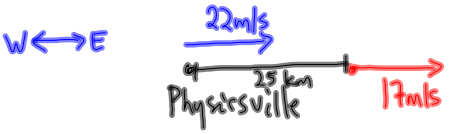
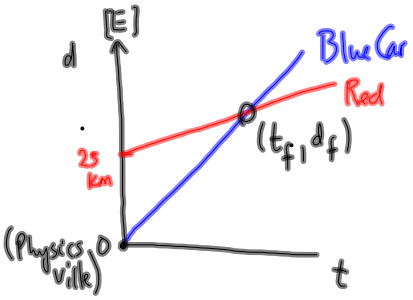
Car Chase Problems

1. Blue Car: $\vec{v}$ = 22 m/s [E], starts at Physics Ville.
   Red Car: $\vec{v}$ = 17 m/s [E], starts at 25 km [E] of P. Ville





A line on a d-t graph has the general equation

$y = mx + b$

$d_f = v\,\Delta t + d_i$

Blue Car: $y = mx + b$

$d_f = (22\text{ m/s})\Delta t + 0$

$d_f = 22\,\Delta t$

Red Car: $y = mx + b$

$d_f = (17\text{ m/s})(\Delta t) + 25000\text{ m}$

$d_f = 17\,\Delta t + 25000$

$22\,\Delta t = 17\,\Delta t + 25000$

$5\,\Delta t = 25000$

$\Delta t = \frac{25000\text{ m}}{5\text{ m/s}}$

$m \div \frac{m}{s} = m \times \frac{s}{m}$

$\Delta t = 5000\text{ s}$

$5 \times 10^3\text{ s}$

$d_f = (22\text{ m/s})(\Delta t)$

$d_f = (22\text{ m/s})(5000\text{ s})$

$d_f = 110\,000\text{ m}$

$\vec{d_f} = 110\text{ km [E]}$ of PVille

$1 \times 10^2\text{ km [E]}$

It took 5000 s for the blue car to catch up with the red car and this happened 110 km [E] of Physicsville.