

35.  $\vec{v}_i = 30 \text{ km/h}$   
 $\vec{v}_f = 30 \text{ km/h}$

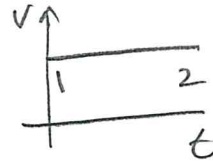
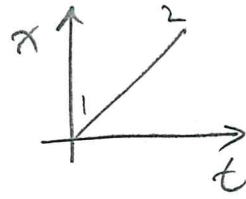
$30 \text{ km/h} = 8.3 \text{ m/s}$

$\rightarrow +$

$\vec{v} = \frac{\Delta \vec{x}}{\Delta t}$

$8.3 = \frac{\Delta \vec{x}}{0.5}$

$\Delta \vec{x} = 4.2 \text{ m/s}$



37.  $\vec{v}_i = 14.0 \text{ m/s}$

$\vec{v}_f = 16.0 \text{ m/s}$

$\Delta t = 4.80 \text{ s}$

~~$\vec{a} = ?$~~

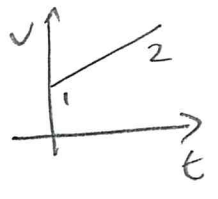
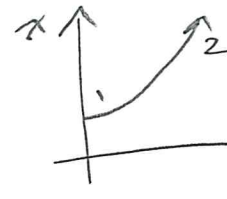
$\Delta \vec{x} = ?$

$\vec{x} = \frac{1}{2}(\vec{v}_i + \vec{v}_f)\Delta t$

$\vec{x} = \frac{1}{2}(14.0 + 16.0)(4.8 \text{ s})$

$= \frac{1}{2}(30 \text{ m/s})(4.8 \text{ s})$

$\vec{x} = 72.0 \text{ m}$



43.  $\vec{v}_i = ?$

$\vec{v}_f = 15.0 \text{ m/s}$

$\Delta \vec{x} = 120 \text{ m}$

$\Delta t = 5.60 \text{ s}$

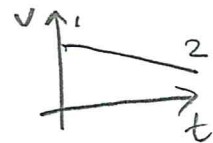
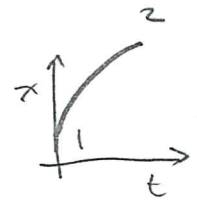
$\Delta \vec{x} = \frac{1}{2}(\vec{v}_i + \vec{v}_f)\Delta t$

$\frac{120 \text{ m}}{5.6} = \frac{1}{2}(\vec{v}_i + 15.0 \text{ m/s})(5.6 \text{ s})$

$21.43 \text{ m/s} = \frac{1}{2}(\vec{v}_i + 15.0 \text{ m/s})$

$42.86 \text{ m/s} = \vec{v}_i + 15.0 \text{ m/s}$

$27.9 \text{ m/s} = \vec{v}_f$  slowing down



44.  $\vec{v}_i = 0 \text{ m/s}$

$\vec{v}_2 = 10.2 \text{ m/s}$

$\vec{a} = ?$

$\Delta t = 2.5 \text{ s}$

~~$\vec{a} = ?$~~

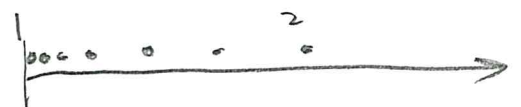
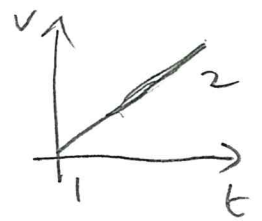
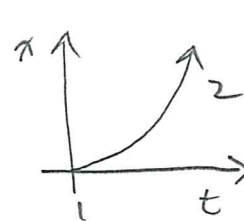
$\vec{v}_2 = \vec{v}_i + \vec{a}\Delta t$

$10.2 \frac{\text{m}}{\text{s}} = 0 + \vec{a}(2.5 \text{ s})$

$10.2 \frac{\text{m}}{\text{s}} = \vec{a}(2.5 \text{ s})$

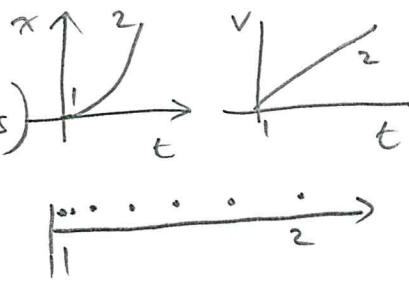
$\vec{a} = \frac{10.2 \text{ m/s}}{2.5 \text{ s}}$

$\vec{a} = 4.1 \text{ m/s}^2$



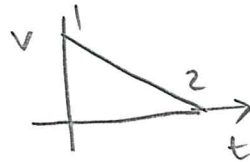
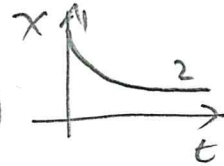
45)  $\vec{v}_1 = 0 \text{ m/s}$   
 $\vec{a} = 2.2 \text{ m/s}^2$   
 $\Delta t = 2.5 \text{ s}$   
 $\vec{v}_f = ?$

$\vec{v}_2 = \vec{v}_1 + \vec{a} \Delta t$   
 $\vec{v}_2 = 0 + (2.2 \frac{\text{m}}{\text{s}^2})(2.5 \text{ s})$   
 $\vec{v}_2 = 5.5 \text{ m/s}$

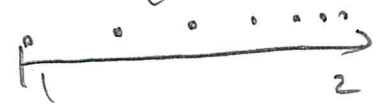


46)  $\vec{v}_1 = 13.0 \text{ m/s}$   
 $\vec{v}_2 = 0 \text{ m/s}$   
 $\Delta t = 0.080 \text{ s}$   
 $\vec{a} = ?$

$\vec{v}_2 = \vec{v}_1 + \vec{a} \Delta t$   
 $0 = 13.0 \text{ m/s} + \vec{a} (0.080 \text{ s})$   
 $-13.0 \text{ m/s} = \vec{a} (0.080 \text{ s})$   
 $\frac{-13.0 \text{ m/s}}{0.080 \text{ s}} = \frac{\vec{a} (0.080 \text{ s})}{0.080 \text{ s}}$



$\boxed{-162.5 = \vec{a}} \quad \vec{a} = -160 \text{ m/s}^2$   
 $\text{m/s}^2$



56)  $\vec{v}_i = 40 \text{ km/h} = 11.1 \text{ m/s}$   
 $\vec{v}_f = ?$   
 $\Delta \vec{x} = ?$   
 $\vec{a} = 2.3 \text{ m/s}^2$   
 $\Delta t = 2.7 \text{ s}$

$\Delta \vec{x} = \vec{v}_i \Delta t + \frac{1}{2} \vec{a} (\Delta t)^2$

$\Delta \vec{x} = (11.1 \frac{\text{m}}{\text{s}})(2.7 \text{ s}) + \frac{1}{2} (2.3 \frac{\text{m}}{\text{s}^2})(2.7 \text{ s})$

$\boxed{\Delta \vec{x} = 38.4 \text{ m}}$

$\vec{v}_2 = \vec{v}_1 + \vec{a} \Delta t$

$\vec{v}_2 = 11.1 \text{ m/s} + (2.3 \frac{\text{m}}{\text{s}^2})(2.7 \text{ s})$

$\boxed{\vec{v}_2 = 17.3 \text{ m/s}}$

