Answers to "Practice Questions (first 2 equations)"

1. $v_i = 16.7\frac{m}{s}$
   $a = 2.5\frac{m}{s^2}$
   $\Delta t = 8.1s$
   $v_f = ?$

   $v_f = v_i + a\Delta t$
   $v_f = 16.7\frac{m}{s} + \left(2.5\frac{m}{s^2}\right)(8.1s)$
   $v_f = 37\frac{m}{s}$

2. $v_i = 12\frac{m}{s}$
   $\Delta t = 4.5s$
   $\Delta d = ?$
   $v_f = 0$

   $\Delta d = \left(\frac{v_i + v_f}{2}\right)\Delta t$
   $\Delta d = \left(\frac{12\frac{m}{s} + 0}{2}\right)(4.5s)$
   $\Delta d = 27m$

3. $v_i = 35km/h$
   $a = 2.0\frac{m}{s^2}$
   $\Delta t = ?$
   $v_f = 95km/h$

   Change km/h to m/s
   $\frac{35km}{1h} \times \frac{1000m}{1km} \times \frac{1h}{3600s} = 9.72m/s$
   $\frac{95km}{1h} \times \frac{1000m}{1km} \times \frac{1h}{3600s} = 26.4m/s$

   $v_f = v_i + a\Delta t$
   $\Delta t = \frac{v_f - v_i}{a}$
   $\Delta t = \frac{26.4\frac{m}{s} - 9.72\frac{m}{s}}{2.0\frac{m}{s^2}}$
   $\Delta t = 8.3s$

4. $v_i = 35\frac{m}{s}$
   $\Delta t = ?$
   $\Delta d = 325m$
   $v_f = 0$

   $\Delta d = \left(\frac{v_i + v_f}{2}\right)\Delta t$
   $\Delta d = \left(\frac{v_i + 0}{2}\right)\Delta t$
   $\Delta t = \frac{2\Delta d}{v_i}$
   $\Delta t = \frac{2(325m)}{35\frac{m}{s^2}}$
   $\Delta t = 19s$

5. $v_i = ?$ $\quad v_f = v_i + a\Delta t$

$a = -2.5 \frac{m}{s^2}$ $\quad v_i = v_f - a\Delta t$

$\Delta t = 5.0s$ $\quad v_i = 17.5 \frac{m}{s} - \left(-2.5 \frac{m}{s^2}\right)(5.0s)$

$v_f = 17.5m/s$ $\quad v_i = 30m/s$

6. $v_i = 0$ $\quad v_f = v_i + a\Delta t$

$a = ?$ $\quad v_f = 0 + a\Delta t$

$\Delta t = 2.5s$ $\quad v_f = a\Delta t$

$v_f = 9.5m/s$ $\quad a = \frac{v_f}{\Delta t}$

$a = \frac{9.5 \frac{m}{s}}{2.5s}$

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$a = 3.8m/s^2$