1a

$$132000\,cm\left(\frac{1\,in}{2.54\,cm}\right)\left(\frac{1\,ft}{12\,in}\right)\left(\frac{1\,mi}{5280\,ft}\right) = 0.820209973\,mi$$

$$\boxed{= 0.820\,mi}$$

b) $$3{,}100.08\,ft\left(\frac{12\,in}{1\,ft}\right)\left(\frac{2.54\,cm}{1\,in}\right)\left(\frac{1\,m}{100\,cm}\right) = 944.904384\,m$$

$$\boxed{= 944.904\,m}$$

c) $$38.46\,g\left(\frac{1\,kg}{1000\,g}\right) = 0.3846\,kg$$

$$\boxed{= 0.3846\,kg}$$

d) $$3\,days\left(\frac{24\,hrs}{1\,day}\right)\left(\frac{3600\,s}{1\,hr}\right) = 259200\ \text{Seconds}$$

$$\boxed{= 300000\,s}$$

2a) $d = vt$ for t

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

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

b) $V = V_0 + at$ for V_0

$$-at \qquad -at$$

$$\boxed{V - at = V_0}$$

2c) $V = V_0 + at$ for t

$-V_0 \quad -V_0$

$$\frac{V}{a} - \frac{V_0}{a} = \frac{\cancel{a}\,t}{\cancel{a}}$$

$$\boxed{t = \frac{V}{a} - \frac{V_0}{a}}$$

2d) $d = d_0 + V_0 t + \frac{1}{2} a t^2$ for "a"

$-d_0 \quad -d_0$

$$d - d_0 = \cancel{V_0 t} + \frac{1}{2} a t^2$$

$-V_0 t \quad \cancel{-V_0 t}$

$$\frac{d - d_0 - V_0 t}{t^2} = \frac{\frac{1}{2} a t^2}{t^2}$$

$$(2)\frac{d - d_0 - V_0 t}{t^2} = \cancel{\tfrac{1}{2}} a \,\cancel{(2)}$$

$$\boxed{\frac{2(d - d_0 - V_0 t)}{t^2} = a}$$

2e) $d = d_0 + V_0 t + \frac{1}{2}at^2$ for V_0

$-\frac{1}{2}at^2 \quad -\frac{1}{2}at^2$

$d - \frac{1}{2}at^2 = d_0 + V_0 t$

$-d_0 \quad -d_0$

$$\frac{d - d_0 - \frac{1}{2}at^2}{t} = \frac{V_0 t}{t}$$

$$\boxed{\frac{d - d_0 - \frac{1}{2}at^2}{t} = V_0}$$

2f) $V^2 = V_0^2 + 2ad$ for V_0

$-2ad \quad -2ad$

$V^2 - 2ad = V_0^2$

$$\boxed{\sqrt{V^2 - 2ad} = V_0}$$

3 a) 160 km − 115 km = 45 km past town

b) he is +115 km

4) $V = \frac{d}{t}$ solve for d

$(t)V = \frac{d}{t}(t)$

$Vt = d = (3.00 \times 10^{8}\ m/s)(8.3\ \cancel{min})\left(\frac{60\ s}{1\ \cancel{min}}\right) =$

$= 1.494 \times 10^{11}\ m$

$\boxed{= 1.5 \times 10^{11}\ m}$

5) $(\Delta t)V = \frac{\Delta d}{\Delta t}(\Delta t)$ solve for Δd

$\Delta d = (\Delta t)(V) = \left(55\ \frac{km}{h}\right)(0.75\ s)\left(\frac{1\ hr}{3600\ s}\right)\left(\frac{1000\ m}{1\ km}\right)$

$= 11.458333\ m =$

$\boxed{11\ m}$

6) $V^2 = V_o^2 + 2ad$ solve for V

$$V = \sqrt{V_o^2 + 2ad}$$

$$= \sqrt{(21\,m/s)^2 + 2(3.0\,m/s^2)(535\,m)}$$

$$= \sqrt{441\,\frac{m^2}{s^2} + 3210\,m^2/s^2}$$

$$= \sqrt{3651\,\frac{m^2}{s^2}} = 60.42350536\,m/s$$

$$\boxed{= 60\,m/s}$$

7) $d = \frac{(V + V_o)t}{2} = \frac{(88\,m/s + 66\,m/s)(12\,s)}{2}$

$$= 924\,m$$

$$\boxed{= 9.2 \times 10^2\,m}$$

8a $V^2 = V_0^2 + 2ad$ solve for d

$-V_0^2 \quad -V_0^2$

$$\frac{V^2 - V_0^2}{2a} = \frac{\cancel{2}\cancel{a}d}{\cancel{2}\cancel{a}} \qquad d = \frac{V^2 - V_0^2}{2a}$$

$$d = \frac{(0\ m/s)^2 - (55\ m/s)^2}{2(-11\ m/s^2)}$$

$$d = \frac{-3025\ m^2/s^2}{-22\ m/s^2} = 137.5\ m$$

$$\boxed{= 1.4 \times 10^2\ m}$$

8b)

$$d = \frac{V^2 - V_0^2}{2a} = \frac{(0\ m/s)^2 - (110\ m/s)^2}{2(-11\ m/s^2)}$$

$$= \frac{-12100\ m^2/s^2}{-22\ m/s^2} = 550\ m$$

$$\boxed{= 5.5 \times 10^2\ m}$$

9) Acceleration = change in velocity divided by change in time

$$V = V_0 + at$$
$$-V_0 \quad -V_0$$
$$\frac{V - V_0}{t} = \frac{a\cancel{t}}{\cancel{t}} \qquad a = \frac{V - V_0}{t}$$

$$= \frac{45\,m/s - 85\,m/s}{4.5\,s}$$

$$= -8.888888889\,m/s^2$$

$$\boxed{= -8.9\,m/s^2}$$

10) $V = V_0 + at$ for t

$$-V_0 \quad -V_0$$
$$\frac{V - V_0}{a} = \frac{\cancel{a}t}{\cancel{a}} \qquad t = \frac{V - V_0}{a}$$

$$= \frac{0\,m/s - 30.8\,m/s}{-4.0\,m/s^2}$$

$$= -7.7\,s$$

$$\boxed{= -7.7\,s}$$