Name: _____

1. A sprinter covers 100 m in 11.2 seconds.
a) Find the average velocity of the sprinter in m/s

$$V = \frac{d}{t} = \frac{100}{11.2} = 8.93 \, m/s$$

b) Convert this speed to km/hr showing all the steps

$$8.93 \, \frac{m}{s} \times \frac{3600 \, sec}{1 \, hour} \times \frac{1 \, km}{1000 \, m} = 32.1 \, km/hr$$

c) What is the shortcut for converting km/hr to m/s?

$$\div \, by \, 3.6$$

2. A car travels at 85 km/hr for 35 mins. How far does it travel?

↳ convert to hour $= \frac{35}{60} = 0.58\overline{3} \, hours.$

$$d = v \cdot t$$

$$= 85 \, km/hr \times 0.58\overline{3} = 49.6 \, km$$

3. A plane travels 580 km in 2 hours 30 mins. How fast is it going? (in km/hr)

↳ $= 2.5 \, hours$

$$V = \frac{d}{t} = \frac{580}{2.5}$$

$$= 232 \, km/hr$$

4. A drag car accelerates from 0 to 29 m/s in 4 seconds. What was the acceleration of the car? Find acceleration in m/s^2

$$a = \frac{\Delta V}{t} = \frac{29-0}{4} = \frac{29}{4} = 7.25 \text{ m/s}^2.$$

5. A mini van accelerates from 20 km/hr to 110 km/hr in 8 seconds. What was the acceleration of the mini van? Find acceleration in m/s^2

$$\Delta V = V_f - V_i = 110 - 20 = 90 \text{ Km/hr} = 25 \text{ m/s}$$
$$\overset{\llcorner \div 3.6}{}$$

$$a = \frac{\Delta V}{t} = \frac{25}{8} = 3.125 \text{ m/s}^2.$$

6. A semi truck accelerates at 1.4 m/s^2. If the truck accelerates for 7.9 seconds from rest, what is the trucks final speed? $\llcorner V_i = 0$

$$V_f = V_i + at$$
$$= 0 + (1.4)(7.9) = 11.06 \text{ m/s}$$

7. A dropped ball accelerates at 9.8 m/s^2. Starting from rest, how long does it take the ball to reach a speed of 25 m/s?

$$V_f = V_i + at$$
$$25 = 0 + (9.8)(t)$$
$$t = \frac{25}{9.8} = 2.55 \text{ sec.}$$

8. A sports car accelerates from 0 to 60 mph in 5.6 seconds. What is the acceleration of the car in m/s^2 ?

$\rightarrow$ google it.

$\boxed{1 \text{ mph} = 1.61 \text{ Km/hr.}}$

① $60 \text{ mph} \times \frac{1.61 \text{ Km/hr}}{1 \text{ mph}} = 96.6 \text{ Km/hr,}$

② $96.6 \text{ Km/hr} \div 3.6 = 26.83 \text{ m/s.}$

③ $a = \frac{\Delta V}{t} = \frac{V_f - V_i}{t} = \cancel{} =$

$$= \frac{26.83 - 0}{5.6} = 4.79 \text{ m/s}^2.$$