Science 10

Name: Key

Calculating acceleration

1. What is the formula for each of the following quantities?

acceleration   change in velocity   time interval

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

2. Complete the following table. Use the motion formula to calculate the missing quantities. Show all your work and use the correct units.

Change in Velocity	Time	Acceleration	Formula Used and Calculation Shown
140 m/s	8 s	17.5 m/s^2	$\vec{a} = \frac{\Delta \vec{v}}{\Delta t} = \frac{140}{8} = 17.5$ m/s
60 km/h	4 h	15 m/s^2	$a = \frac{v}{t} = \frac{60}{4} = 15 \frac{m}{s^2}$
120 km/h	2.5 h	48 km/h^2	$t = \frac{v}{a} = \frac{120}{48} = 2.5 h$
52.5 m/s	15 s	3.5 m/s^2	$v = a \cdot t = (3.5)(15) = 52.5 \frac{m}{s}$
12 m/s	2.5 s	4.8 $\frac{m}{s^2}$	$a = \frac{v}{t} = \frac{12}{25} = 4.8 \frac{m}{s^2}$
25 m/s	2 s	12.5 m/s^2	$t = \frac{v}{a} = \frac{12.5}{25} = 2 s$
48 km/h	9.6 h	5 km/h^2	$v = a \cdot t = (5)(9.6) = 48 \frac{km}{h}$