Acceleration (a)

acceleration describes all situations were the speed is changing.

symbol to represent acceleration is a

Formula: $a = \frac{v_2 - v_1}{t}$

During **constant acceleration (uniform acceleration)** the same change in speed occurs in each equal interval of time. The object accelerates at the same rate.

Average acceleration (a_{av})occurs when acceleration changes over a period of time. The acceleration rate varies.

If you are slowing down your acceleration can be negative

For ALL our calculations acceleration is assumed to be constant

If your acceleration was $2m/s^2$ that means you are increasing your speed by 2m/s for every second you travel.

So at the end of the 1st second your speed is 2m/s
at the end of the 2nd second your speed is 4m/s

If your acceleration was $4.5m/s^2$ how fast would you be going at the end of the 2nd second?

9.0m/s

Example Problem 1:
You speed up a motorcycle from rest (0m/s) to 9m/s in a time of 2.0s. What is your acceleration?
$v_1 = 0$ m/s
$v_2 = 9.0$ m/s
$t = 2.0$s

$$a = \frac{v_2 - v_1}{t} = \frac{9.0m/s - 0m/s}{2.0s} = \frac{9.0m/s}{2.0s} = 4.5m/s^2$$

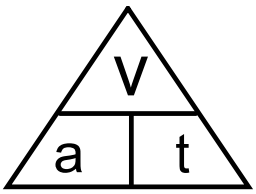
Example Problem 2:

A roller coaster accelerates at 8.0m/s^2 for 4.0s. What is the change in the speed of the roller coaster?

a= 8.0 m/s^2
t = 4.0s
v = ?

YOU MUST REARRANGE THE EQUATION FOR V!!

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



$$v = a \times t$$

$$v = 8.0 m/s^2 \times 4.0 s$$

$$v = 32 m/s$$

Complete questions pg 388 #1-5, 7-9