Physics 12
Acceleration

1. The acceleration of an object can be determined by calculating the rate of change of velocity of the object.

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

2. If an object is changing its acceleration then average acceleration can be used. The formula for average acceleration is:

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

Example: A F-14 Tomcat accelerates along a straight runway from rest to 225km/h in 2.5s. What is the magnitude of its average acceleration?

First ensure the units are consistent and convert km/h to m/s by dividing by 3.6 (exact number).

$$\frac{225km/h}{3.6} = 62.5 \ m/s$$

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

$$\vec{a} = \frac{\vec{V} - \vec{V_o}}{\Delta t}$$

$$\vec{a} = \frac{62.5m/s - 0}{2.5s}$$

$$a = 25m/s^2$$
(Note: a boat could never do this)