

## Physics with Synno – Motion-2 – Lesson 6

### M.2.4 Acceleration

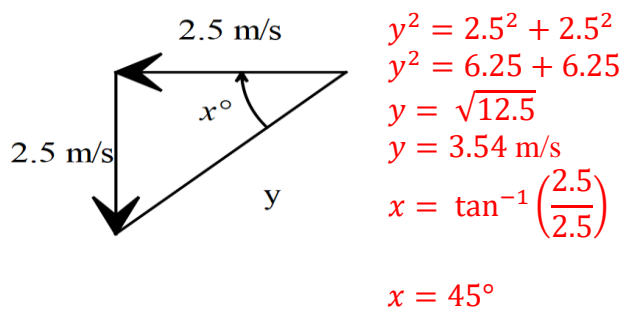
Acceleration is a quantity which tells us about the **change** in velocity of an object and is a vector. Acceleration is defined as the change in velocity over time.

Thus 
$$\vec{a} = \frac{\Delta v}{t} = \frac{v_2 - v_1}{t}$$

The units of acceleration are  $\text{ms}^{-2}$ .

**Example** Jack is traveling at a velocity of  $2.5 \text{ ms}^{-1}$  North and makes a  $90^\circ$  left hand turn. If it takes 2 seconds to make the turn, what is his acceleration?

$$\begin{aligned}\Delta v &= v_2 - v_1 = v_2 + (-v_1) \\ -v_1 &= 2.5 \text{ m/s South} \\ v_2 &= 2.5 \text{ m/s West}\end{aligned}$$



Change in velocity is  $3.54 \text{ m/s}$  W  $45^\circ$  S or S  $45^\circ$  W or SW

$$\vec{a} = \frac{3.54}{2} = 1.77 \text{ m/s}^2 \text{ SW}$$

**Problem Set#6:** Text Page 304 All Questions