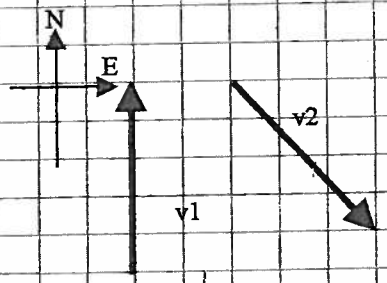
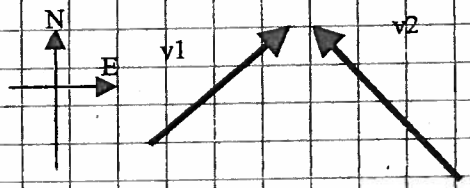
12 Physics

Acceleration Vectors in 2 - Dimensions

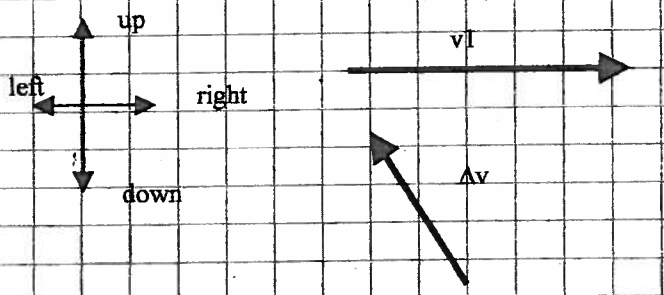
1. Calculate the change in velocity given the following initial and final velocity vectors.
   Scale: 1cm = 1.0 m/s



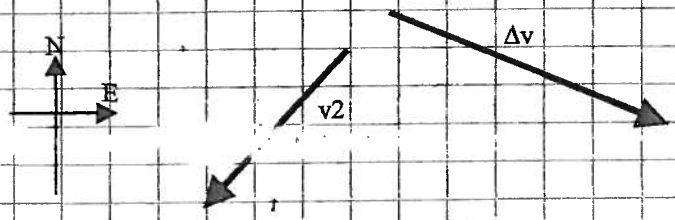
2. Calculate the acceleration over a time interval of 2.5 seconds given the following initial and final velocity vectors over the interval. Scale: 1cm = 5.0 m/s



3. Find the final velocity for an object given the object's initial velocity and change in velocity as shown below. Scale: 1 cm = 20 km/h



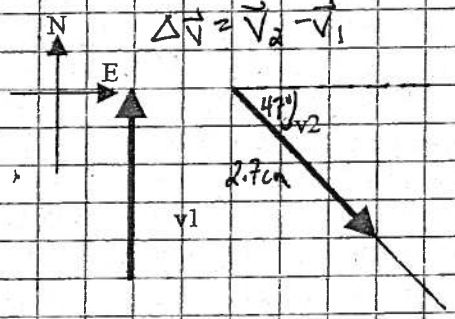
4. Find the initial velocity for an object given the object's final velocity and change in velocity as shown below. Scale: 1 cm = 30 m/s



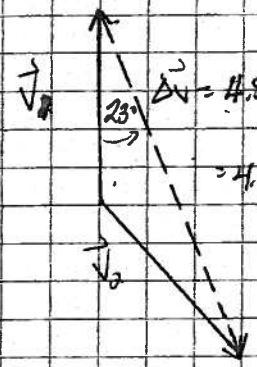
12 Physics

Acceleration Vectors in 2 - Dimensions

1. Calculate the change in velocity given the following initial and final velocity vectors.
Scale: 1cm = 1.0 m/s

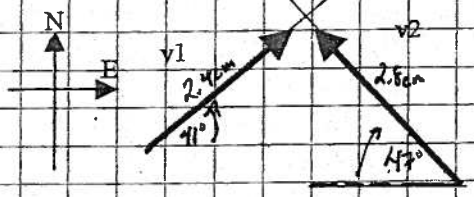


$\Delta\vec{v} = \vec{v}_2 - \vec{v}_1$

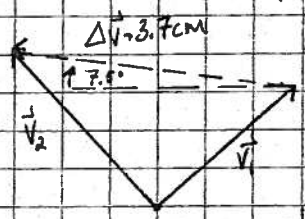


$\Delta\vec{v} = 4.8\ m/s\ [23°E\ of\ S]$

2. Calculate the acceleration over a time interval of 2.5 seconds given the following initial and final velocity vectors over the interval. Scale: 1cm = 5.0 m/s



$\Delta\vec{v} = \vec{v}_2 - \vec{v}_1$



$\Delta\vec{v} = 3.7cm \times \frac{5.0\ m/s}{cm}$ [8° N of W]

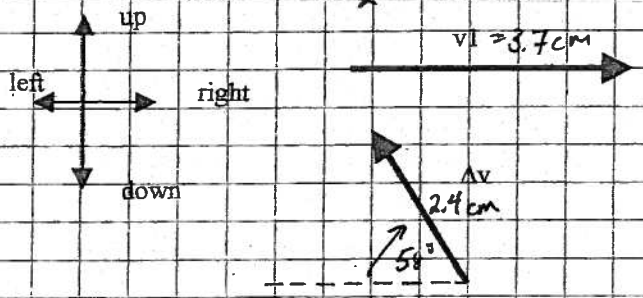
$= 18.5\ m/s$ [8° N of W]

$\vec{a} = \frac{\Delta\vec{v}}{\Delta t} = \frac{18.5\ m/s}{2.5\ s}$ [8° N of W]

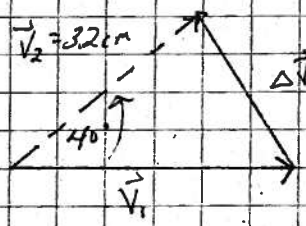
$\vec{a} \simeq 7.4\ m/s^2$ [8° N of W]

3. Find the final velocity for an object given the object's initial velocity and change in velocity as shown below. Scale: 1 cm = 20 km/h

$\vec{v}_2 = \vec{v}_1 + \Delta\vec{v}$

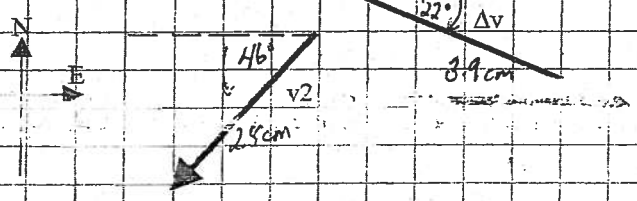


$\vec{v}_2 = 3.2cm \times \frac{20\ km/h}{cm}$ [40° N of E]

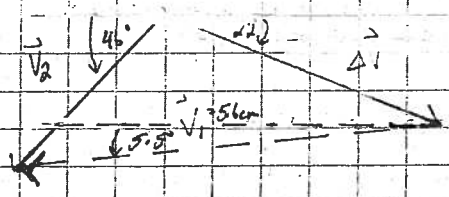


$\vec{v}_2 = 64\ km/h$

4. Find the initial velocity for an object given the object's final velocity and change in velocity as shown below. Scale: 1 cm = 30 m/s



$\vec{v}_1 = \vec{v}_2 - \Delta\vec{v}$



$\vec{v}_1 = 5.6cm \times \frac{30\ m/s}{cm}$ [6° S of W]

$= 1.7 \times 10^2\ m/s$ [6° S of W]