

Masters for transparencies

5.1 Term 1



materie en materiale

Eliminatie-reactie

- Dehidrohalogenering
Hitte; basis opgelos in etanol → Alkeen + water + halidesout
- Dehidriering
Hitte; suwewebruik → Alkeen + water
- Termiese kragting
Toestand: hoë temperatuur; hoë druk; geen katalisator → Mengsel van alkene vorm.
- Katalitiese kragting
Laer temperatuur; 'n katalisator; gematigde las druk → Kort ketting alkene vorm.

1.7.2.1 Dehidrohalogenering

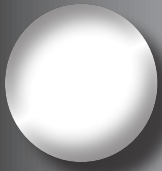
Reaksiestoestand:
Temperatuur: Word sterk verhit;
Toerewordig: Stank bakke; NaOH of KOH in suwer etanol opgelos; warm etanoliese NaOH of KOH.
Produk: Alkeen + water + H₂

$\begin{array}{c} \text{---C---C---} \\ | \quad | \\ \text{H} \quad \text{Y} \end{array}$

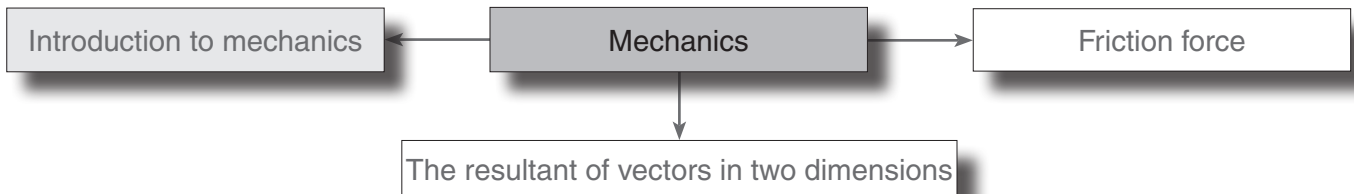
Voorbeelde:

$\begin{array}{c} \text{H} \quad \text{H} \\ | \quad | \\ \text{H---C---C---H} \\ | \quad | \\ \text{H} \quad \text{Br} \\ \text{bromostaan} \end{array} + \text{Na---O} \xrightarrow[\Delta]{\text{stans}} \begin{array}{c} \text{H} \quad \text{H} \\ \backslash \quad / \\ \text{C} = \text{C} \\ / \quad \backslash \\ \text{H} \quad \text{H} \\ \text{eteen} \end{array} + \text{Na---Br} + \text{H---O}$

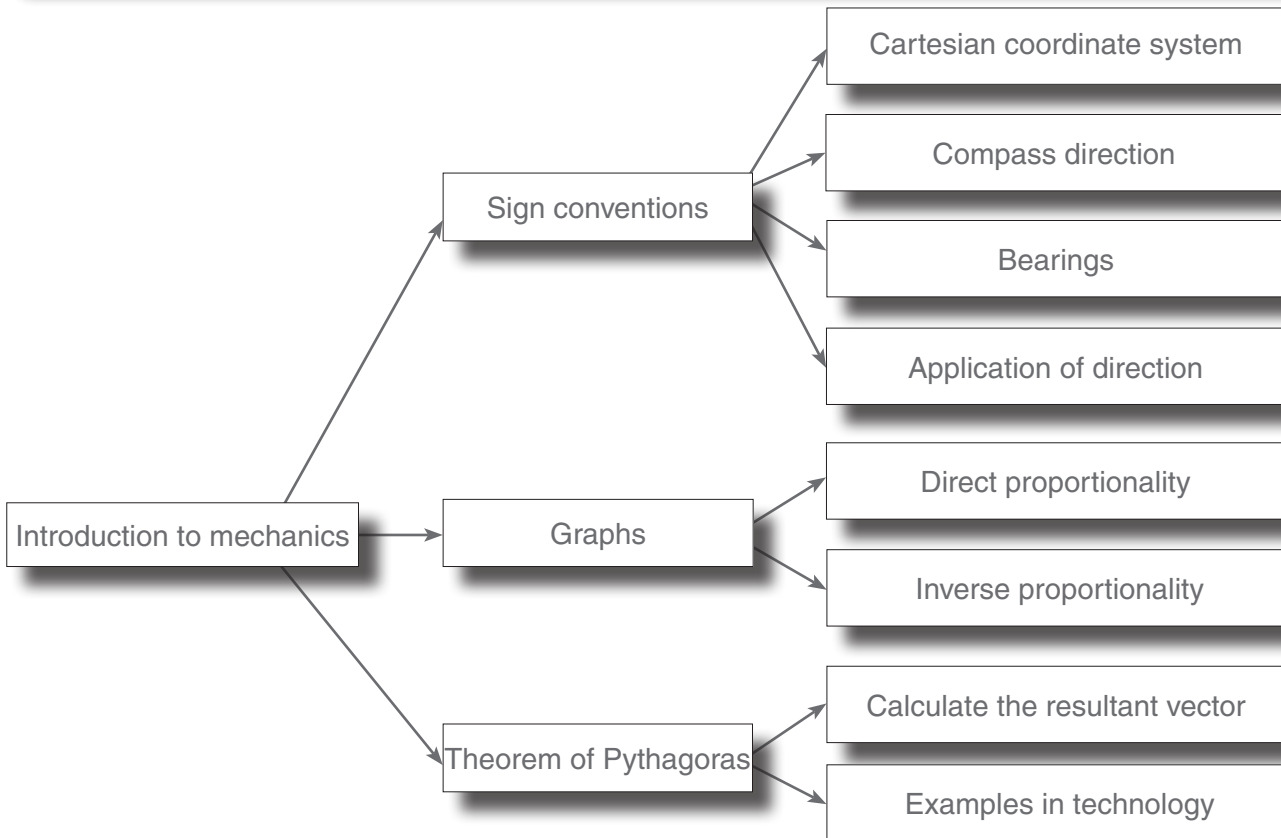
195 CHEMIE voorbereidingsêër - Graad 12 Die Boekie



TERM 1: MECHANICS



UNIT 1 INTRODUCTION TO MECHANICS



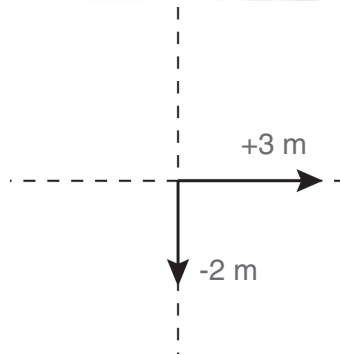
1.1 Sign conventions

A scalar is a physical quantity with only magnitude. A scalar value is written as a magnitude and a unit.

A vector is a physical quantity with magnitude and direction. A vector value is written as a magnitude with a unit and a direction.

1.1.1 Cartesian coordinate system

Example



Example

The magnitude of force vector A is

$$A = \sqrt{4^2 + 3^2}$$

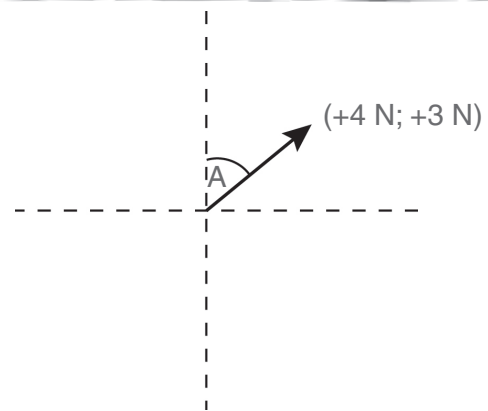
$$= 5 \text{ N}$$

The direction of force vector A is

$$\tan \theta = \frac{3}{4}$$

$$\theta = \tan^{-1} \left(\frac{3}{4} \right)$$

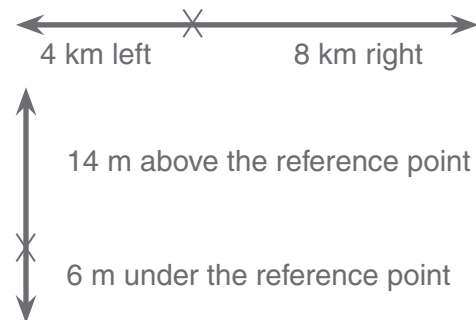
$$= 36,87^\circ$$



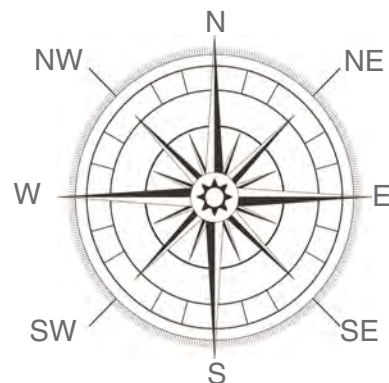
Example

There must be a point or system of axes used as a reference.

- A fixed point can be used to describe horizontal movement from left to right or from west to east.
- A fixed point can be used as a reference point from which to describe vertical movement: upwards or downwards from a point.
- A fixed point can be used as a reference point for a compass bearing.



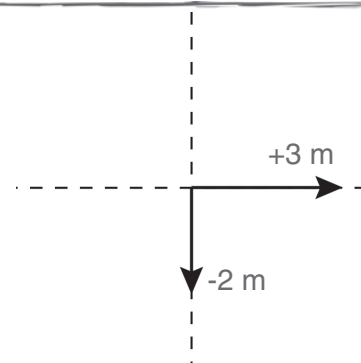
1.1.2 Compass directions



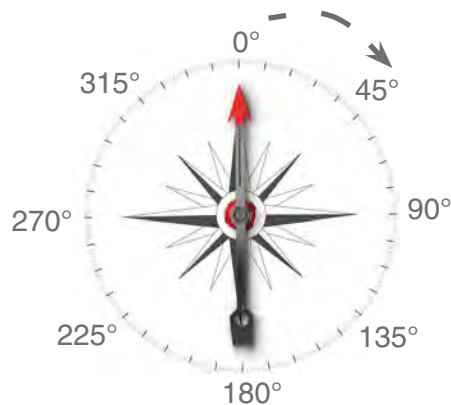


Example

Two displacements of 3 m east and 2 m south respectively.

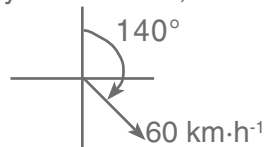


1.1.3 Bearings



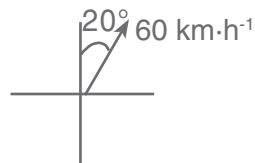
Examples

A car that moves at $60 \text{ km}\cdot\text{h}^{-1}$ maintains a velocity of $60 \text{ km}\cdot\text{h}^{-1}$, 140° .



OR

A car maintains a velocity of $60 \text{ km}\cdot\text{h}^{-1}$, 20° .



1.1.4 Applications of direction

Examples

- Displacement:
35 m east; 300 km 260° ; 56 m
- Velocity:
 $35 \text{ m}\cdot\text{s}^{-1}$ west; $30 \text{ km}\cdot\text{h}^{-1}$ 135° ; $56 \text{ m}\cdot\text{s}^{-1}$



- Acceleration:
5 m·s⁻² north; 30 m·s⁻² 95°; 56 m·s⁻²
- Force:
35 N east; 300 N 260°; 56 N; 140 N above the horizontal level
- Gravitational, electrical and magnetic fields:
Gravitational fields are always attractive and directed towards the centre of the object; electric fields are always directed from the positive to the negative, and magnetic fields are always directed from north to south.

Exercise 1

1 Classify the following as scalars or vectors.

	Description	Vector/scalar
1.1	The mass of a baby	Scalar
1.2	The speed of a train	Scalar
1.3	The attractive force of a magnet	Vector
1.4	Time taken to run 100 m.	Scalar
1.5	The velocity of a bullet	Vector
1.6	The displacement of a ship	Vector
1.7	An applied force of 40 N.	Vector
1.8	The energy used when wood burns.	Scalar
1.9	Energy of a battery	Scalar
1.10	Kinetic energy	Scalar

2 Define the following:

2.1 vector;

A physical quantity with magnitude, a unit and direction

2.2 scalar.

A physical quantity with magnitude and a unit, but no direction.