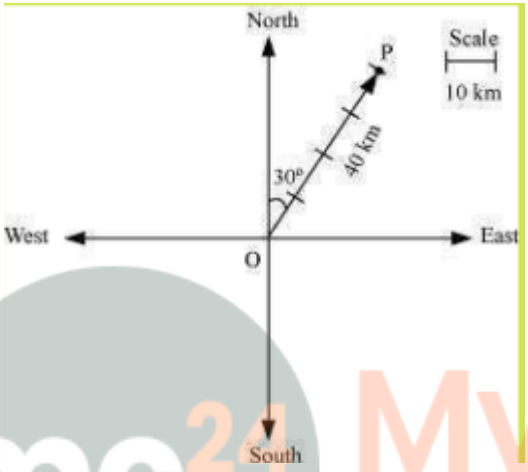
NCERT Solutions for Class-XII Maths

Chapter-10.1

NCERT Chemistry Class 12

1. Represent graphically a displacement of 40 km, 30° east of north.

1.



Here, vector $\overrightarrow{OP}$ represents the displacement of 40 km, 30° East of North.

2. Classify the following measures as scalars and vectors.

(i) 10 kg

(ii) 2 meters north-west

(iii) 40°

(iv) 40 watt

(v) 10^{-19} coulomb

(vi) 20 m/s^2

2. Scalars are defined as quantities that have magnitude only.

Vectors are defined as a quantity that has magnitude as well as direction.

(i) 10 kg: It is a measure of mass. It is a scalar quantity as it has magnitude only and no direction.

(ii) 2 meters north-west: It is a measure of distance in a particular direction. ∴ It is a vector quantity as it has magnitude as well as direction.

(iii) 40°: It is a measure of angle. It is a scalar quantity as it has magnitude only and no direction.

(iv) 40 Watt: It is a measure of power. It is a scalar quantity as it has magnitude only and no direction.

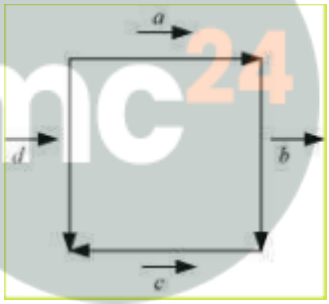
(v) 10^{-19} coulomb: It is a measure of electric charge. It is a scalar quantity as it has magnitude only and no direction.

(vi) 20 m/sec^2: It is a measure of acceleration. It is a vector quantity as it is a measure of rate of change of velocity.

3. Classify the following as scalar and vector quantities.
(i) time period (ii) distance (iii) force
(iv) velocity (v) work done

3. (i) Time period is a scalar quantity as it involves only magnitude.
(ii) Distance is a scalar quantity as it involves only magnitude.
(iii) Force is a vector quantity as it involves both magnitude and direction.
(iv)Velocity is a vector quantity as it involves both magnitude as well as direction.
(v) Work done is a scalar quantity as it involves only magnitude.

4. In Fig 10.6 (a square), identify the following vectors.
(i) Coinitial (ii) Equal
(iii) Collinear but not equal



4.

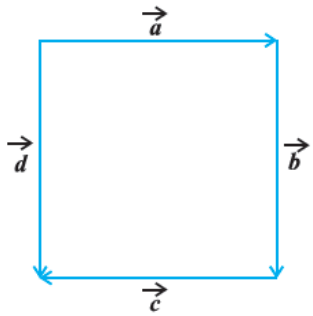


Fig 10.6

(i) Coinitial vectors: Two or more vectors having same initial point are called coinitial vectors.

So, in the above figure $\vec{a}$ and $\vec{d}$ are coinitial vectors as they have same initial point.

∴ Coinitial vectors: $\vec{a}$ and $\vec{d}$

(ii) Equal vectors: Two or more vectors having same direction and same magnitude are called equal vectors.

So, in the above figure $\vec{b}$ and $\vec{d}$ are equal vectors as they have same magnitude and same direction.

$\therefore$ Equal vectors: $\vec{b}$ and $\vec{d}$

(iii) Collinear but not equal:

$\because \vec{a}$ and $\vec{c}$ are parallel vectors, so, they are collinear. But they have opposite direction, so, they are not equal.

Hence, $\vec{a}$ and $\vec{c}$ are collinear but not equal.

5. Answer the following as true or false.

(i). $\vec{a}$ and $-\vec{a}$ are collinear.

5. (i) True.

Vectors $\vec{a}$ and $\vec{a}$ are parallel to the same line.

(ii) False.

Collinear vectors are those vectors that are parallel to the same line.

(iii) False.