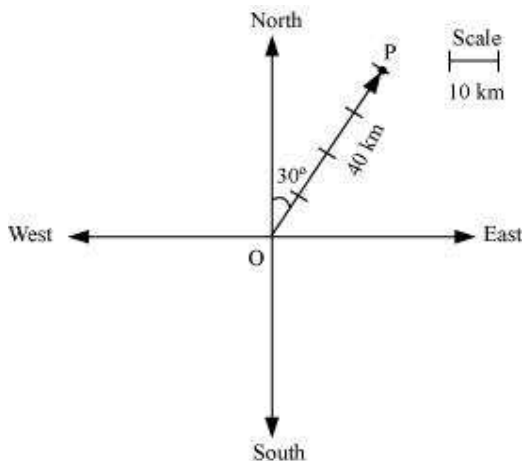


## Exercise 10.1

**Question 1:**

Represent graphically a displacement of 40 km,  $30^\circ$  east of north.

Answer



Here, vector  $\overline{OP}$  represents the displacement of 40 km,  $30^\circ$  East of North.

**Question 2:**

Classify the following measures as scalars and vectors.

- (i) 10 kg (ii) 2 metres north-west (iii)  $40^\circ$   
(iv) 40 watt (v)  $10^{-19}$  coulomb (vi)  $20 \text{ m/s}^2$

Answer

- (i) 10 kg is a scalar quantity because it involves only magnitude.  
(ii) 2 meters north-west is a vector quantity as it involves both magnitude and direction.  
(iii)  $40^\circ$  is a scalar quantity as it involves only magnitude.  
(iv) 40 watts is a scalar quantity as it involves only magnitude.  
(v)  $10^{-19}$  coulomb is a scalar quantity as it involves only magnitude.  
(vi)  $20 \text{ m/s}^2$  is a vector quantity as it involves magnitude as well as direction.

**Question 3:**

Classify the following as scalar and vector quantities.

- (i) time period (ii) distance (iii) force

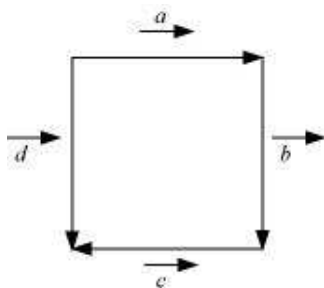
(iv) velocity (v) work done

Answer

- (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.

**Question 4:**

In Figure, identify the following vectors.



- (i) Coinitial (ii) Equal (iii) Collinear but not equal

Answer

- (i) Vectors  $\vec{a}$  and  $\vec{d}$  are coinitial because they have the same initial point.
- (ii) Vectors  $\vec{b}$  and  $\vec{c}$  are equal because they have the same magnitude and direction.
- (iii) Vectors  $\vec{a}$  and  $\vec{c}$  are collinear but not equal. This is because although they are parallel, their directions are not the same.

**Question 5:**

Answer the following as true or false.

- (i)  $\vec{a}$  and  $-\vec{a}$  are collinear.
- (ii) Two collinear vectors are always equal in magnitude.
- (iii) Two vectors having same magnitude are collinear.
- (iv) Two collinear vectors having the same magnitude are equal.

Answer

- (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.