Motion

1.Motion
2.Types of motion
3. Speed
4. Vectors
5.Distance, Time

In physics, motion is a change in position of an object over time.

Motion is described in terms of displacement, distance, velocity, acceleration, time, and speed.

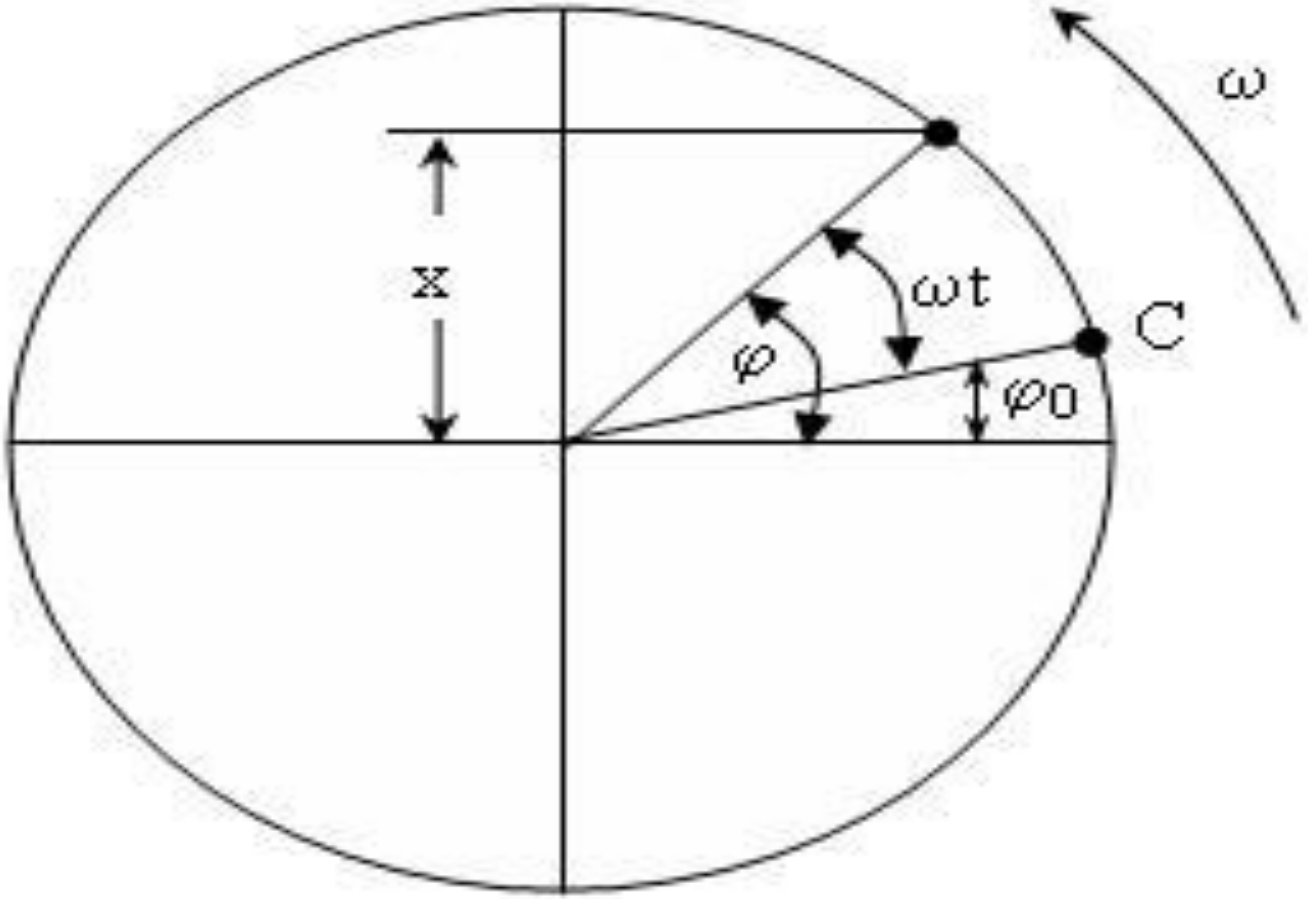
Types of motion

1.Uniform motion
2.Linear motion
3.non-uniform motion
4.Circular motion
4.Projectile motion
5.Elliptic motion
6.Accelerated and decelerated motion
7.Motion with constant acceleration or deceleration

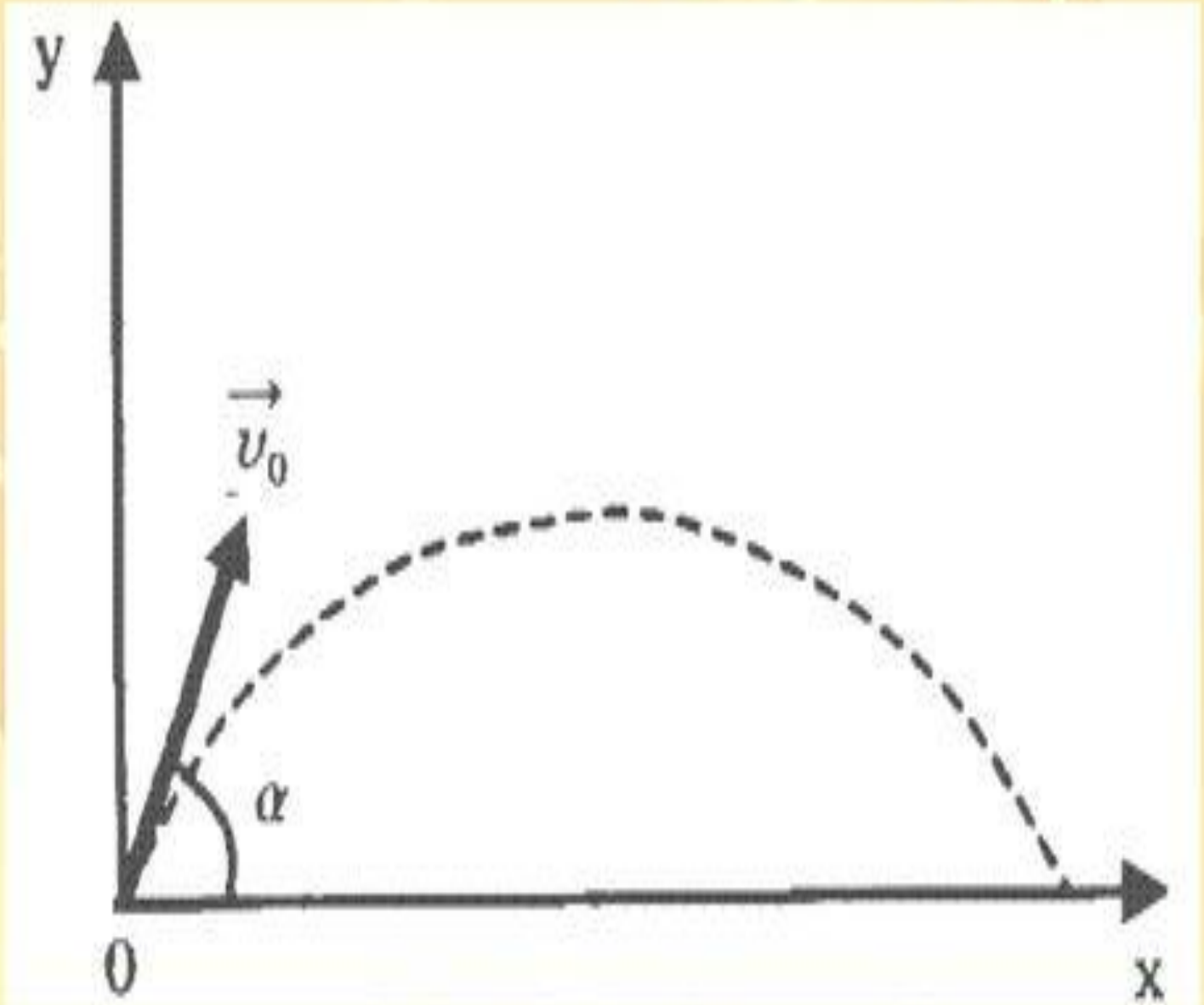
If the body moves equally along the same length, the motion is called a uniform motion.

If the body moves in an equally distinct time, it is called non-uniform motion.

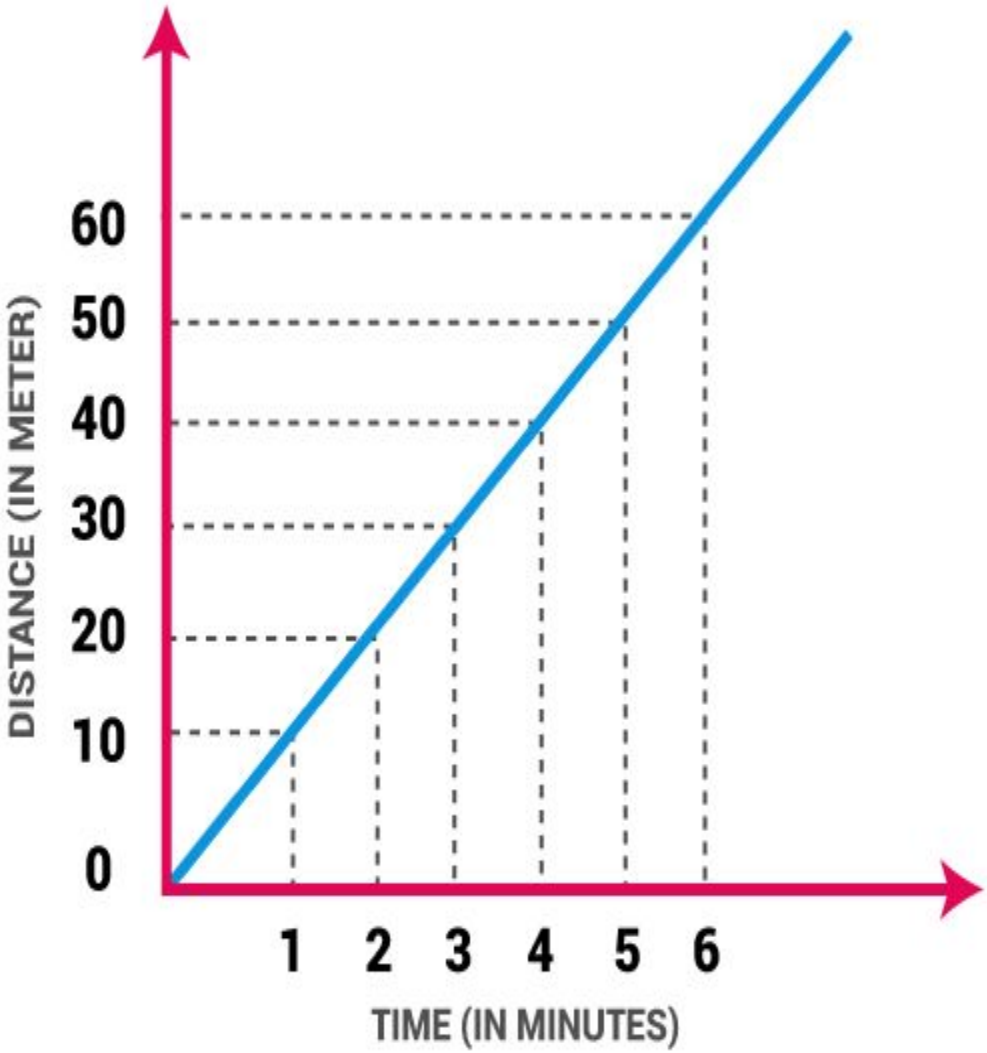
What kind of motions do these photos refer to?

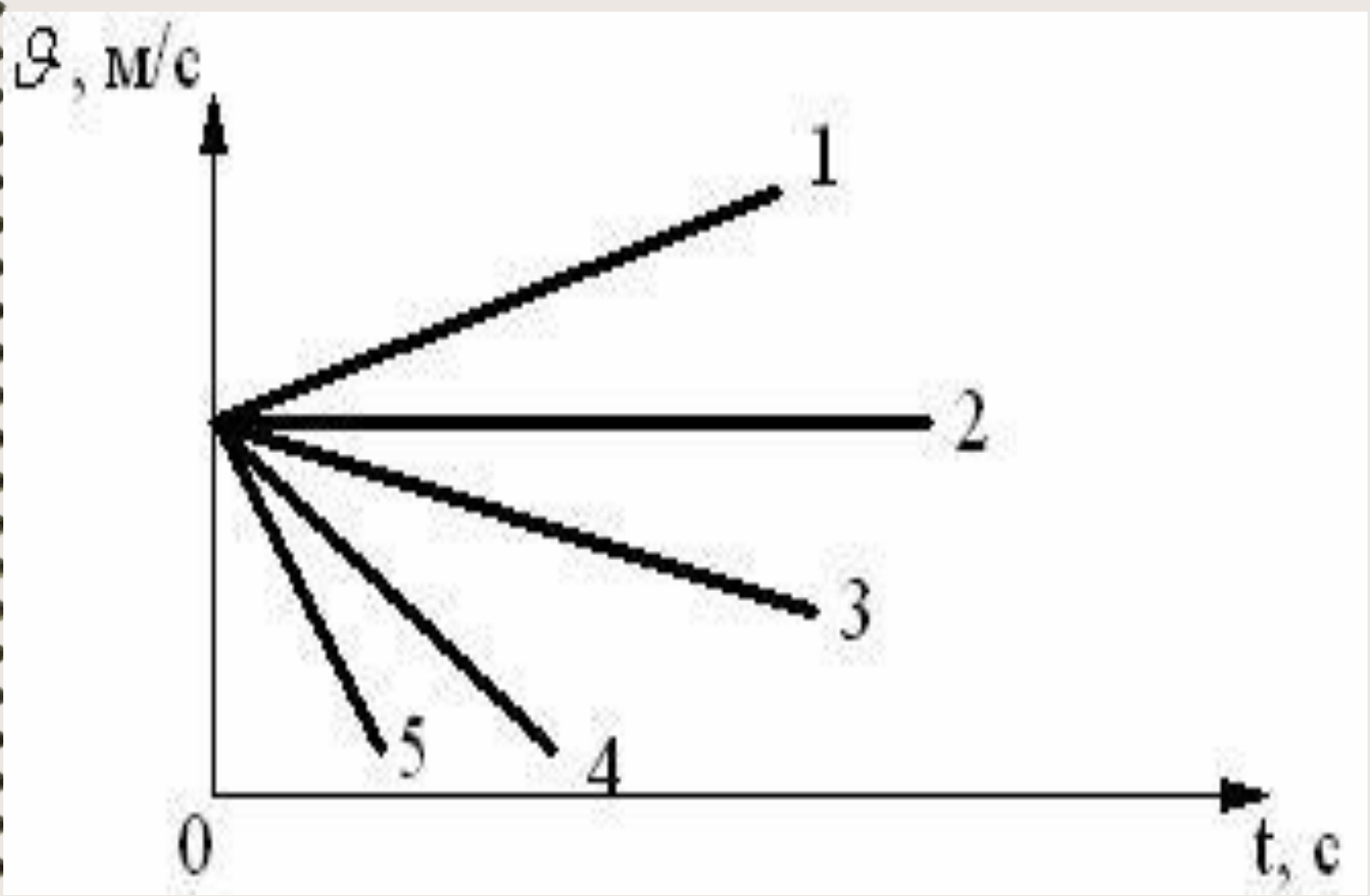


Circular Motion


y
$\vec{v}_0$
α
0
x

UNIFORM MOTION GRAPH



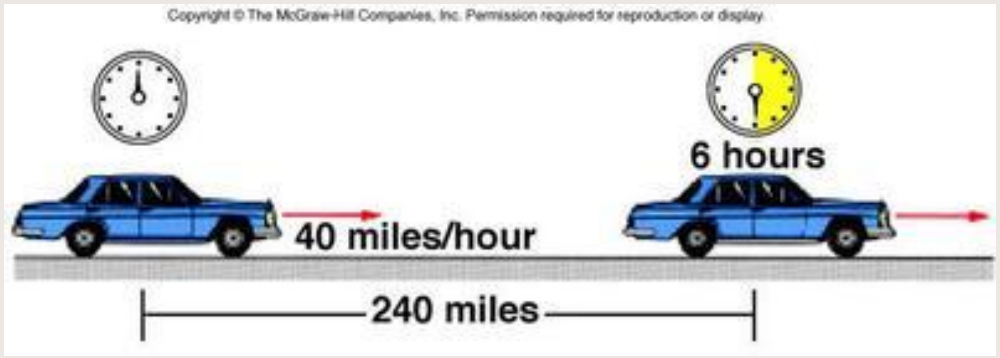

υ, м/с
1
2
3
4
5
0
t, с

2-1. Speed

- Definitions:
  - Speed
    - The rate at which something moves a given distance.
    - Faster speeds = greater distances
  - General formula for speed:
    - Speed = distance / time
    - Abbreviations commonly used:

      d = distance t = time v = speed

$$v = d/t$$



2-1. Speed

Velocity

$$v = \left(\frac{d}{t}\right) = \left(\frac{100 miles}{2.5 hours}\right) = 40\frac{miles}{hour} = 40 mph$$

Distance

$$d = v \cdot t = 30\left(\frac{miles}{hour}\right) \cdot 6 hours = 180 miles$$

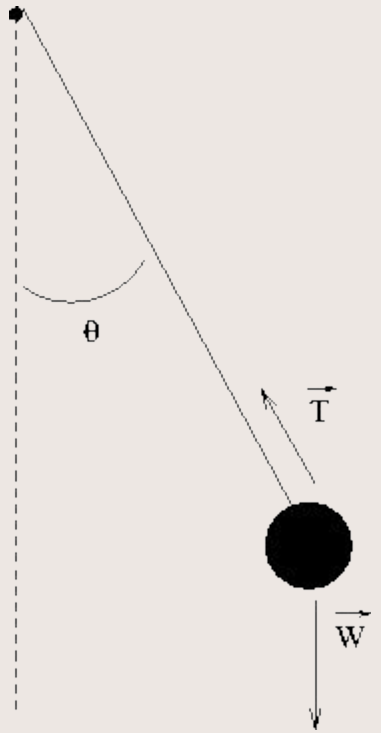
Time

$$t = \left(\frac{d}{v}\right) = \left(\frac{100 miles}{40 miles / hour}\right) = 2.5\frac{miles}{miles / hour} = 2.5 hours$$

2-1. Speed

Average speed is the total distance traveled by an object divided by the time taken to travel that distance.

Instantaneous speed is an object's speed at a given instant of time.

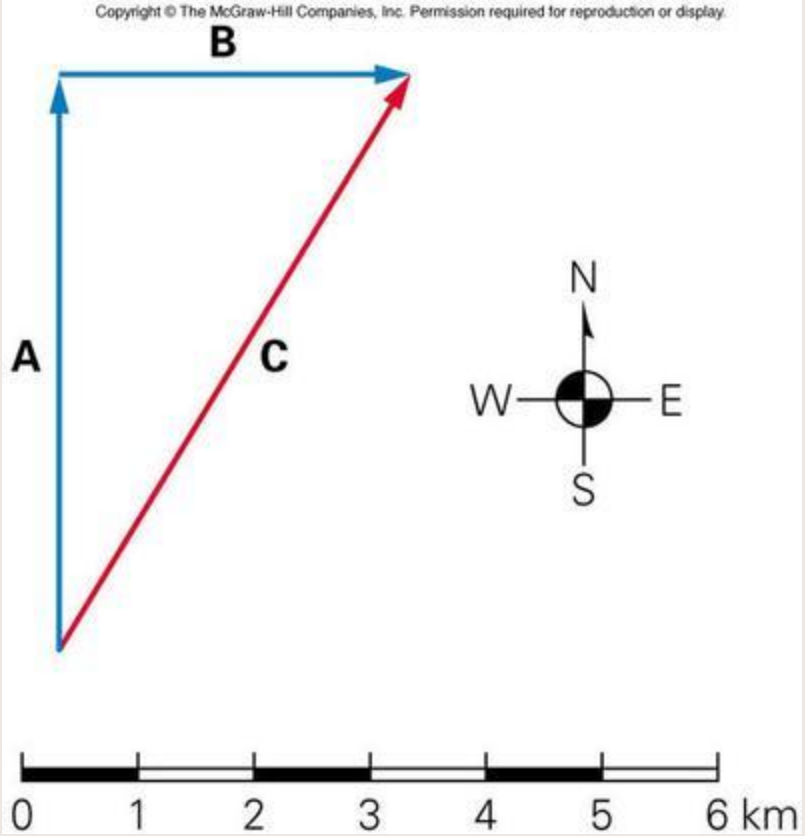


2-2. Vectors

Magnitude of a quantity tells how large the quantity is.

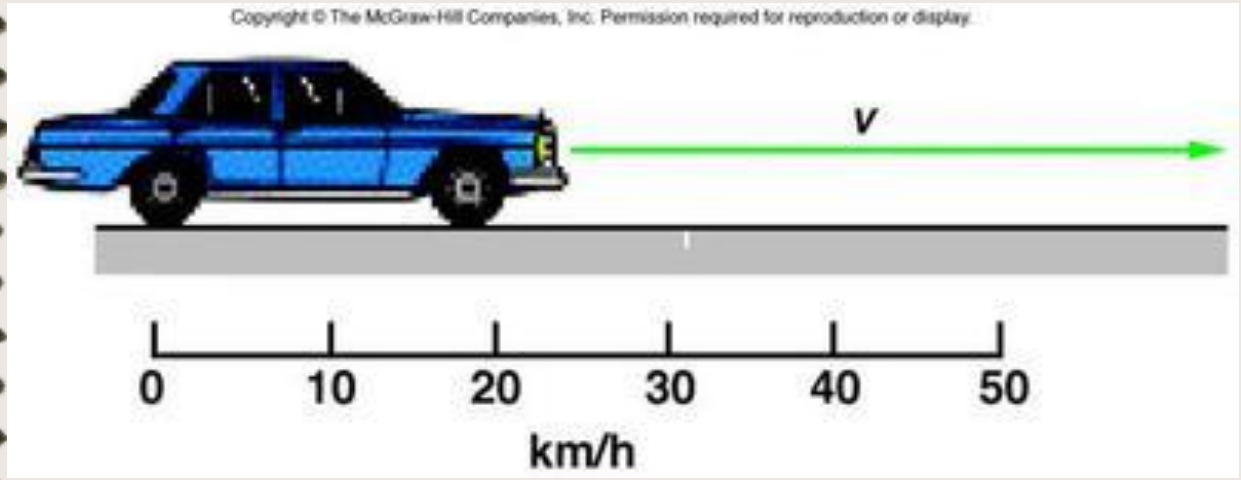
Scalar quantities have magnitude only.

Vector quantities have both magnitude and direction.



2-2. Vectors

Velocity is a vector quantity that includes both speed and direction.



2- 4. Distance, Time

$$v_{avg} = \frac{(V_1 + V_2)}{2} \qquad \frac{(20_{mph} + 60_{mph})}{2} = 40_{mph}$$

$$d = v_{avg}\, t \qquad 30_{mph}\, 2_{hr} = 60_{miles}$$

Semantic card

	Uniform motion	Decelera tion	Position	Санақ нүктесі	Орын ауыстыр у	Равноме рное движени е	ускорен ие
Орын							
Displasem ent							
Reference point							
Бірқалы пты қозғалыс							
Тежелу							
Uniform motion							
Үдеу							