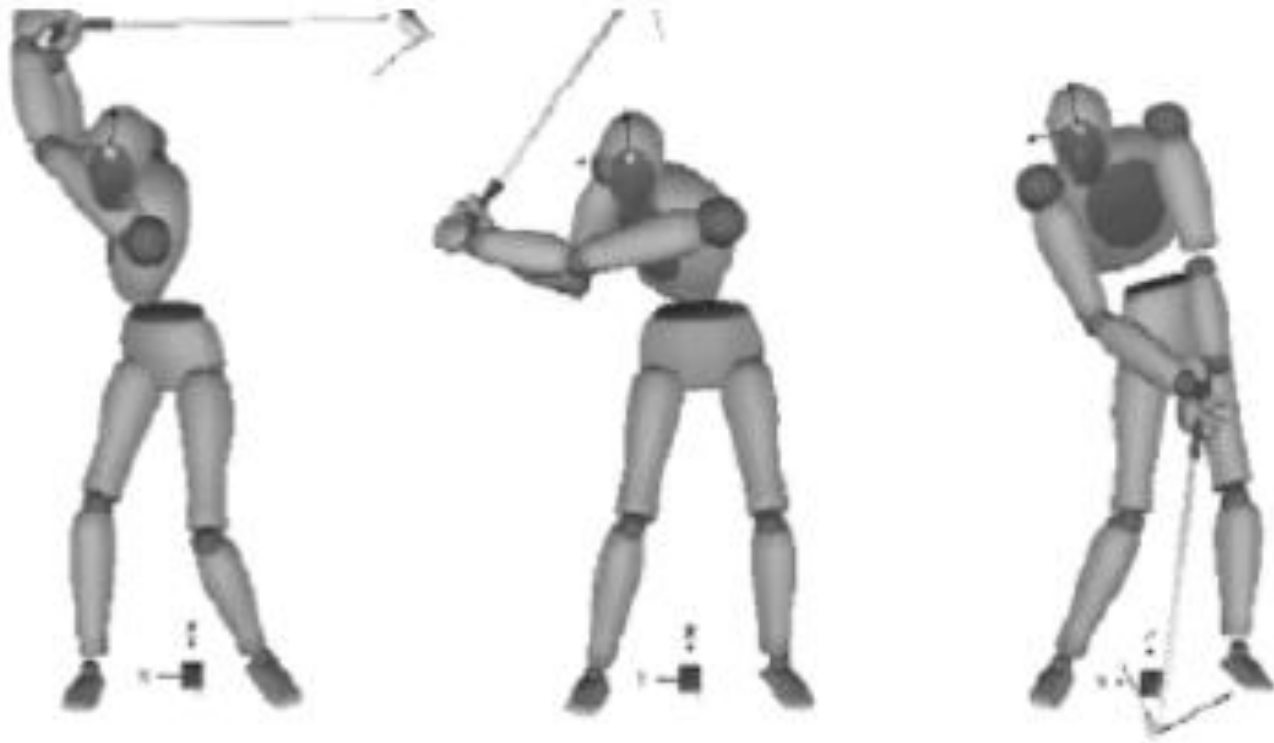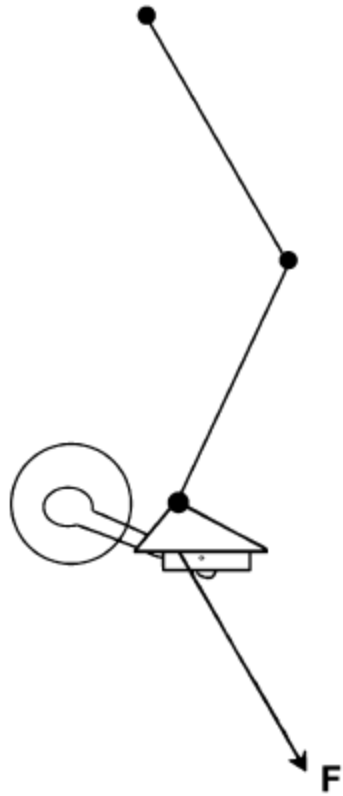# Dasar Mekanika

Kinematika Linear

Kinematika Linear

- Mekanika : Cabang dari ilmu fisika yang mengukur gerak dari suatu objek dan menjelaskan dasar/sebab dari gerak tersebut.

- Kinematika : Suatu deskripsi yang akurat tentang gerak dan merupakan dasar untuk bisa mengerti biomekanika dari gerak pada manusia.

- Kinetika : Gaya gaya yang menyebabkan gerak pada manusia.

Kinematika

Kinetika

Kinematika Linear

- Kinematika berkisar antara deskripsi anatomi dari pergerakan sendi hingga pengukuran matematika secara tepat dari gerak muskuloskeletal
- Terbagi menjadi Linear dan Angular
- Gerak Linear : Pergerakan dimana semua bagian tubuh berjalan dengan jarak yang sama diwaktu yang sama dan arah yang sama. 2titik ➜ Paralel

Kinematika Linear

- Kinematika = Studi tentang geometri, pola atau bentuk gerak yang berkenaan dengan waktu.

- Kinematika Linear : Studi tentang bentuk, pola dan rangkaian gerak linear dengan waktu tanpa menyinggung gaya atau gaya yg menyebabkan gerakan atau gaya yang disebabkan oleh gerakan tersebut.

Besaran Kinematika Linear

- Seorang mahasiswa pamor meninggalkan basecampnya dan berjalan mendaki gunung selama 4 jam. Jika posisi akhirnya berjarak 1,3 km dari basecampnya secara relatif ketika diukur dengan pedometer.
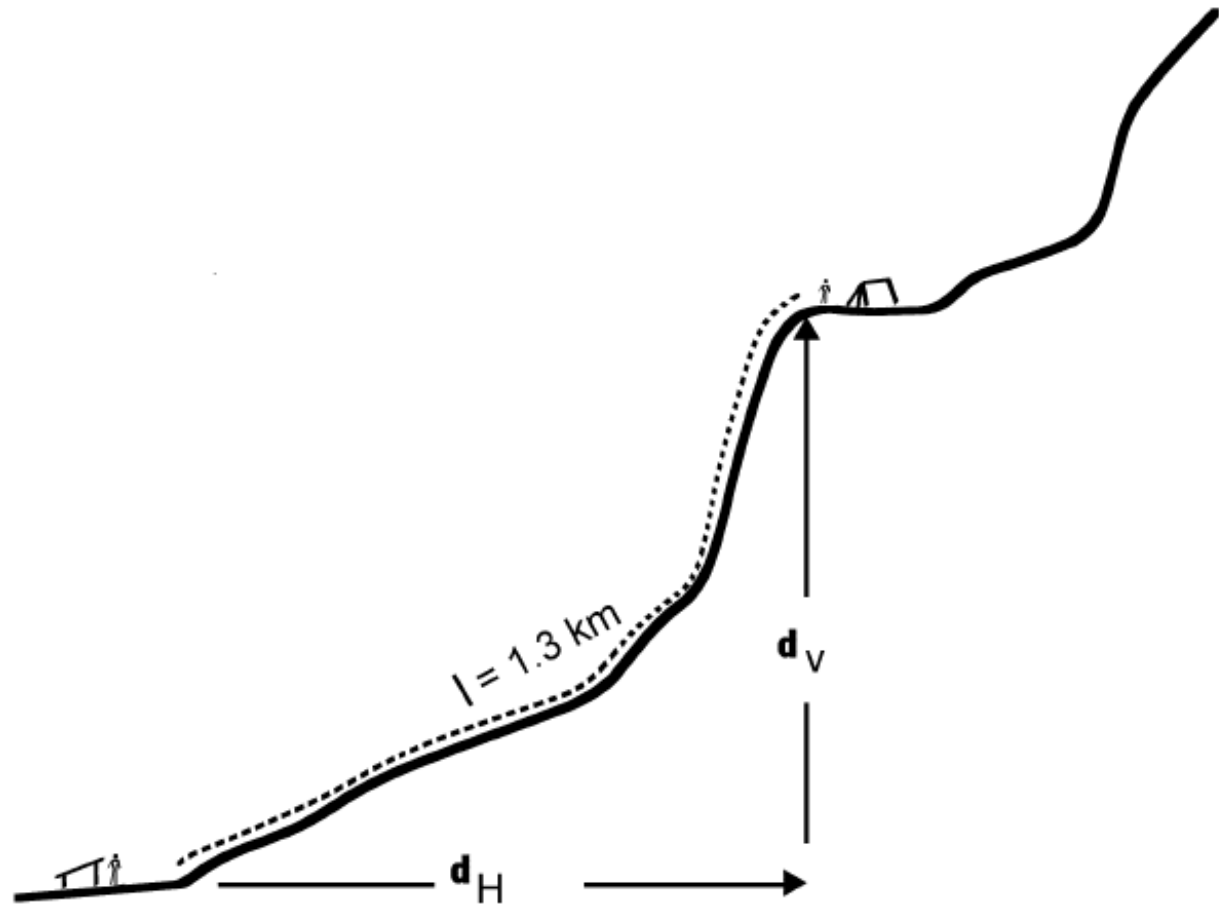
Besaran Kinematika Linear

Figure 5.1. An outdoor adventurer climbs from base camp to a camp following the illustrated path. The distance the climber covers is 1.3 km. Her displacement is 0.8 km horizontally and 0.7 km vertically.

Besaran Kinematika Linear

- Jarak (distance / ℓ) dan Perpindahan (displacement / d)
  - Satuannya adalah satuan panjang.
  - Meter (m), Inci, foot/kaki, yard (0,91 m), Mil (1,61 km)
- Jarak = skalar
- Perpindahan = vektor

Besaran Kinematika Linear

- Speed (kelajuan) dan Velocity (kecepatan)
  - Speed is how fast an object is moving without regard to direction.
  - Speed = ℓ / t
  - Satuan speed = m/s, ft/s, km/hr dll
  - Konversi nilai ??
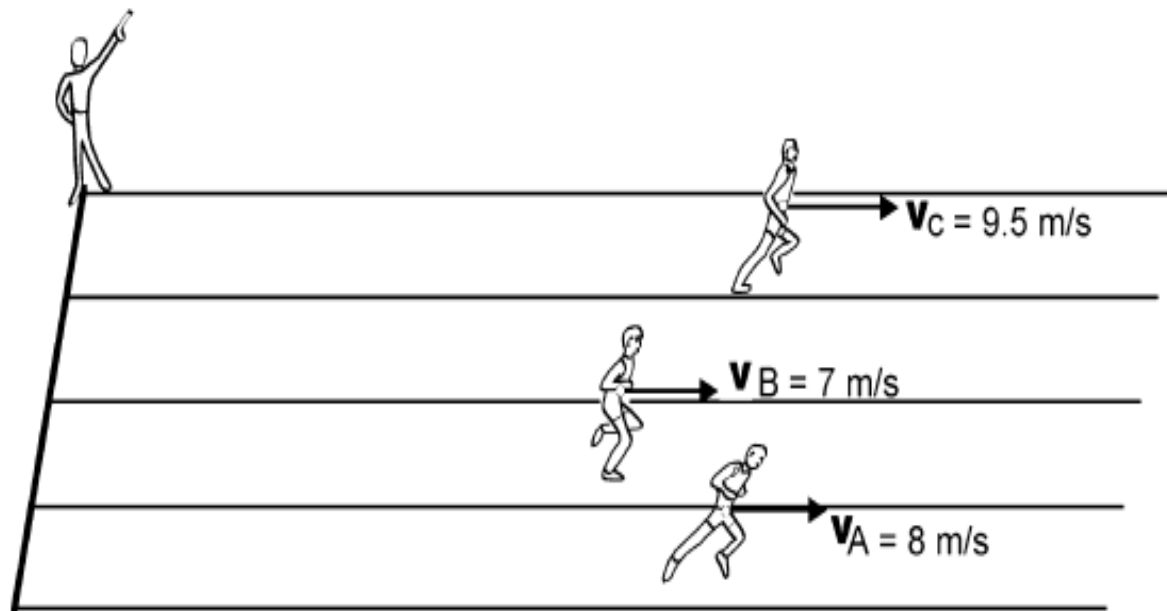
Besaran Kinematika Linear

Figure 5.2. The speed of runner A depends on the frame of reference of the measurement. Runner A can be described as moving at 8 m/s relative to the track or –1.5 m/s relative to runner C.

Besaran Kinematika Linear

- Velocity (kecepatan)
  - Velocity is the vector corresponding to speed.
  - $V = d / t$
  - Satuannya = speed
  - Vector = vertikal, horisontal dan resultan

Besaran Kinematika Linear

Figure 5.3. The horizontal plane path (dashed line) of a physical education student changing practice stations. The linear displacements can be measured along a water fountain axis and equipment axis.

Besaran Kinematika Linear

- Let's assume that **dE = 8 m and dW = 2 m and that the time it** took this student to change stations was 10 seconds.

Besaran Kinematika Linear

- Acceleration (percepatan)
  - Is how quickly velocity is changing
  - Velocity changes when speed or direction change.
  - a = v / t
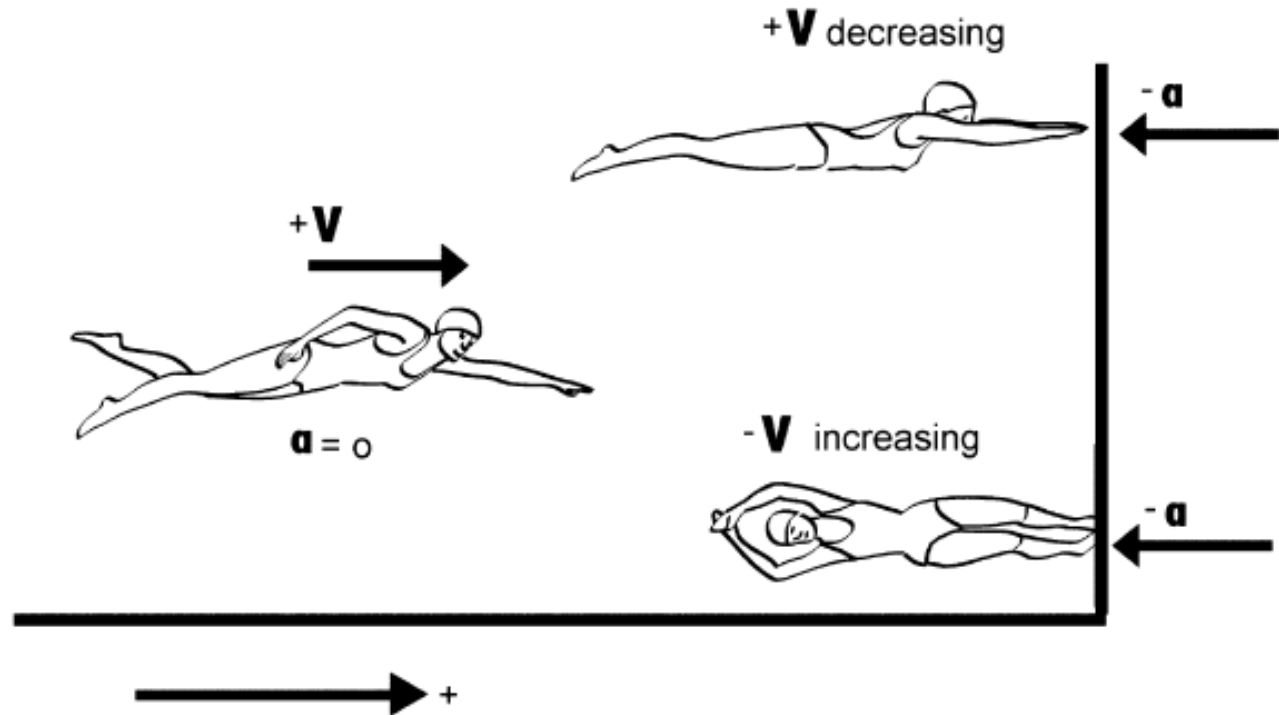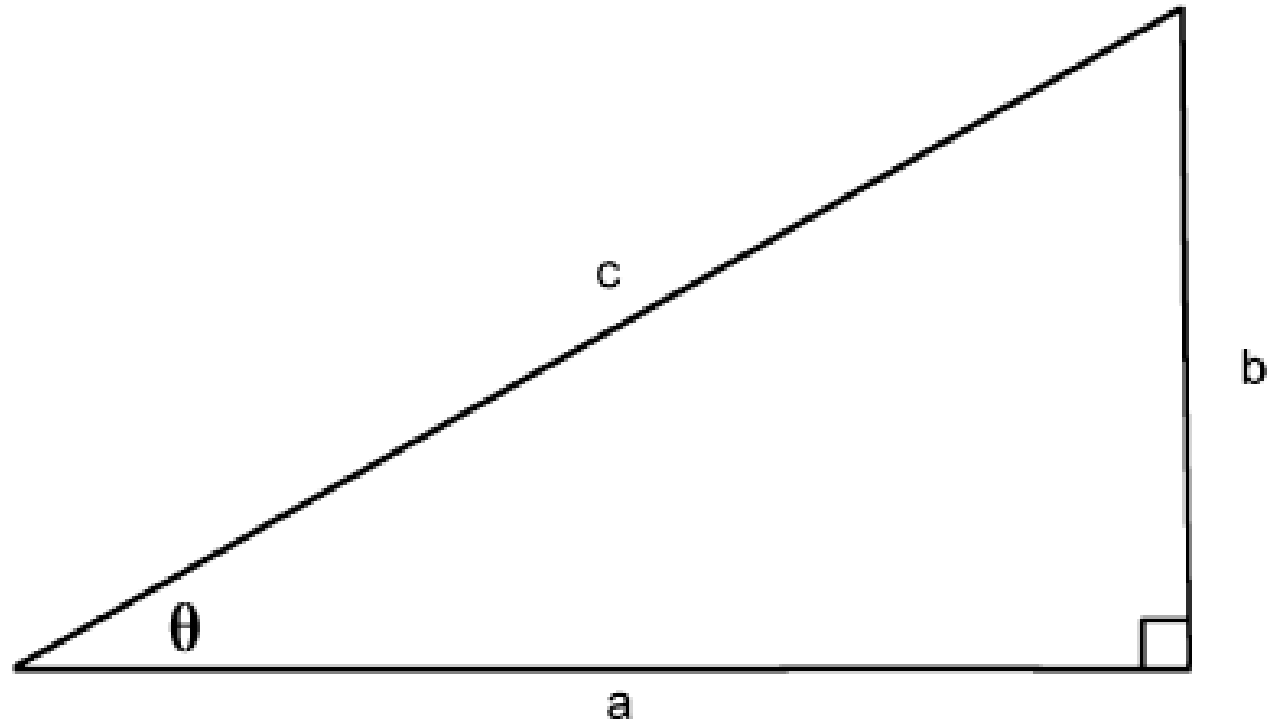 - m/s^2 , ft/s^2

Besaran Kinematika Linear

Figure 5.5. The motion and accelerations of swimmers as they change direction in lap swimming. If motion to the right is designated positive, the swimmer experiences a negative acceleration as they make the turn at the pool wall. The negative acceleration first slows positive velocity, and then begins to build negative velocity to start swimming in the negative direction. It is important to associate signs and accelerations with directions.

Refresing

$$\sin \Theta = b/c$$
$$\cos \Theta = a/c$$
$$\tan \Theta = b/a$$