

Determinación gráfica de las velocidades y aceleraciones en los grupos de II clase

Diagram of a slider-crank mechanism. Link 1 is the ground, link 2 is the crank, link 3 is the connecting rod, and link 4 is the slider. Point B is the crank pivot, C is the connecting rod pivot, and D is the slider pivot. Velocities \vec{v}_B , \vec{v}_D and accelerations \vec{a}_B , \vec{a}_D are shown. A point M is marked on link 3.

Velocity vector triangle (p, b, c, d):

$$\vec{v}_c = \vec{v}_B + \vec{v}_{CB} \perp_{CB}$$

$$\vec{v}_c = \vec{v}_D + \vec{v}_{CD} \perp_{CD}$$

Acceleration vector triangle (p, b, c, d):

$$\vec{a}_c = \vec{a}_B + \vec{a}_{CB}^n \parallel_{CB} + \vec{a}_{CB}^t \perp_{CB}$$

$$\vec{a}_c = \vec{a}_D + \vec{a}_{CD}^n \parallel_{CD} + \vec{a}_{CD}^t \perp_{CD}$$

Diagram of a slider-crank mechanism where the slider (link 4) moves along a curved path S. Link 1 is ground, link 2 is crank, link 3 is connecting rod, and link 4 is slider. Point B is the crank pivot, C and C4 are the connecting rod pivots. Angular velocity ω_4 and angular acceleration ϵ_4 of the slider are shown. Velocities \vec{v}_B , \vec{v}_{C4} and accelerations \vec{a}_B , \vec{a}_{C4} are shown.

Velocity vector triangle (p, b, c, c4):

$$\vec{v}_c = \vec{v}_B + \vec{v}_{CB} \perp_{CB}$$

$$\vec{v}_c = \vec{v}_{C4} + \vec{v}_{CC4} \parallel_{x-x}$$

Acceleration vector triangle (p, b, c, c4):

$$\vec{a}_c = \vec{a}_B + \vec{a}_{CB}^n \parallel_{CB} + \vec{a}_{CB}^t \perp_{CB}$$

$$\vec{a}_c = \vec{a}_{C4} + \vec{a}_{CC4}^c \parallel_{C4} + \vec{a}_{CC4}^r \perp_{C4}$$

Diagram of a slider-crank mechanism where the slider (link 4) moves along a vertical guide. Link 1 is ground, link 2 is crank, link 3 is connecting rod, and link 4 is slider. Point B is the crank pivot, C and C4 are the connecting rod pivots. Velocities \vec{v}_B , \vec{v}_{C4} and accelerations \vec{a}_B , \vec{a}_{C4} are shown.

Velocity vector triangle (p, b, c, c4):

$$\vec{v}_c = \vec{v}_B + \vec{v}_{CB} \perp_{BC}$$

$$\vec{v}_c = \vec{v}_{C4} + \vec{v}_{CC4} \parallel_{BC}$$

Acceleration vector triangle (p, b, c, c4):

$$\vec{a}_c = \vec{a}_B + \vec{a}_{CB}^n \parallel_{CB} + \vec{a}_{CB}^t \perp_{CB}$$

$$\vec{a}_c = \vec{a}_{C4} + \vec{a}_{CC4}^c \parallel_{C4} + \vec{a}_{CC4}^r \parallel_{BC}$$

Diagram of a slider-crank mechanism where the slider (link 4) moves along a horizontal guide. Link 1 is ground, link 2 is crank, link 3 is connecting rod, and link 4 is slider. Point B is the crank pivot, C is the connecting rod pivot. Angular velocity ω_1 and angular acceleration ϵ_1 of the crank are shown. Velocities \vec{v}_{B1} , \vec{v}_{B3} , \vec{v}_{C4} and accelerations \vec{a}_{B1} , \vec{a}_{B3} , \vec{a}_{C4} are shown.

Velocity vector triangle (p, b2, b3, b1):

$$\vec{v}_{B2} = \vec{v}_{B1} + \vec{v}_{B2B1} \parallel_{x-x}$$

$$\vec{v}_{B2} = \vec{v}_{B3} + \vec{v}_{B2B3} \parallel_{y-y}$$

Acceleration vector triangle (p, b2, b3, b1):

$$\vec{a}_{B2} = \vec{a}_{B1} + \vec{a}_{B2B1}^c \parallel_{B2B1} + \vec{a}_{B2B1}^r \parallel_{x-x}$$

$$\vec{a}_{B2} = \vec{a}_{B3} + \vec{a}_{B2B3}^c \parallel_{B2B3} + \vec{a}_{B2B3}^r \parallel_{y-y}$$

Diagram of a slider-crank mechanism where the slider (link 4) moves along a horizontal guide. Link 1 is ground, link 2 is crank, link 3 is connecting rod, and link 4 is slider. Point B is the crank pivot, C is the connecting rod pivot. Angular velocity ω_4 and angular acceleration ϵ_4 of the slider are shown. Velocities \vec{v}_B , \vec{v}_{B4} and accelerations \vec{a}_B , \vec{a}_{B4} are shown.

Velocity vector triangle (p, b, b2, b4):

$$\vec{v}_{B2} = \vec{v}_B + \vec{v}_{B2B}^c \parallel_{y-y}$$

$$\vec{v}_{B2} = \vec{v}_{B4} + \vec{v}_{B2B4}^c \parallel_{x-x}$$

Acceleration vector triangle (p, b, b2, b4):

$$\vec{a}_{B2} = \vec{a}_B + \vec{a}_{B2B}^c \parallel_{B2B} + \vec{a}_{B2B}^r \parallel_{y-y}$$

$$\vec{a}_{B2} = \vec{a}_{B4} + \vec{a}_{B2B4}^c \parallel_{B2B4} + \vec{a}_{B2B4}^r \parallel_{x-x}$$