

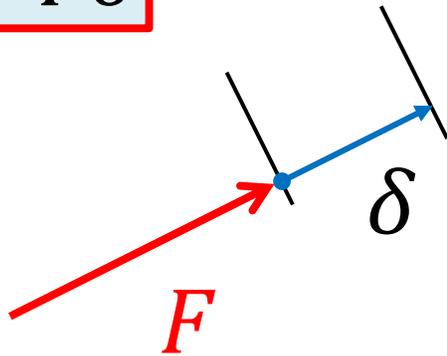
General Form of the Principal of Virtual Work

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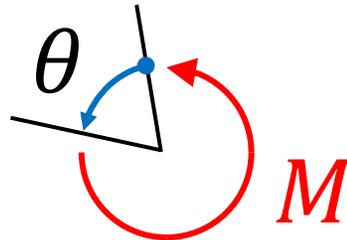
Work Done by Force/Moment

$$W = F\delta$$



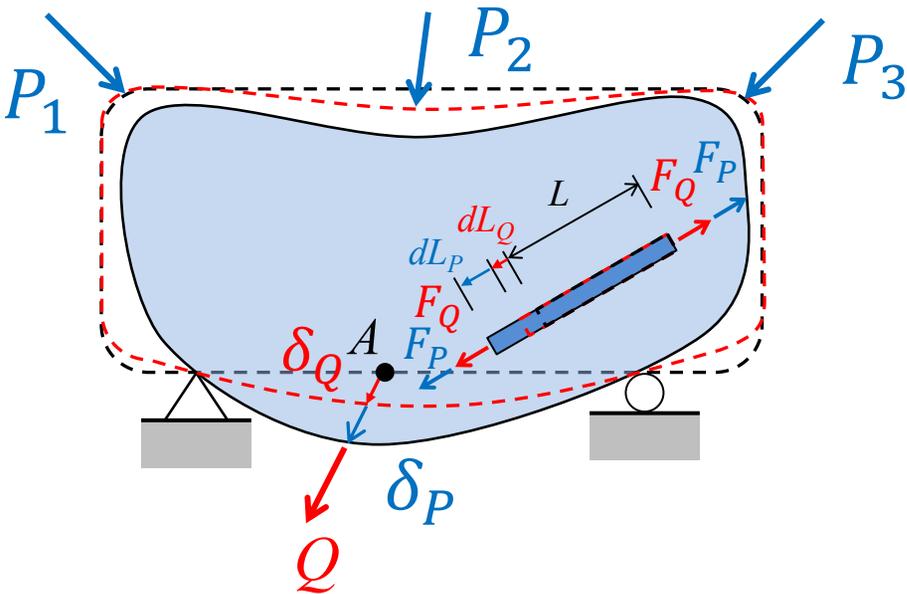
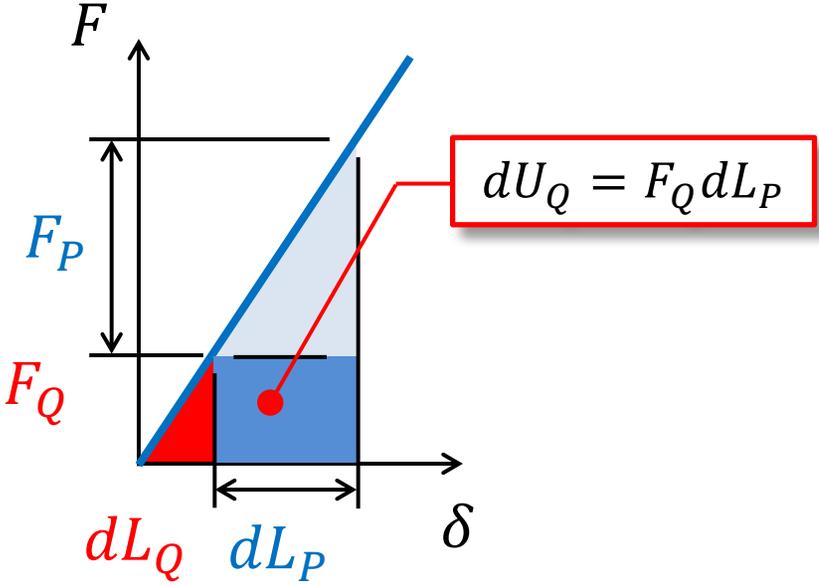
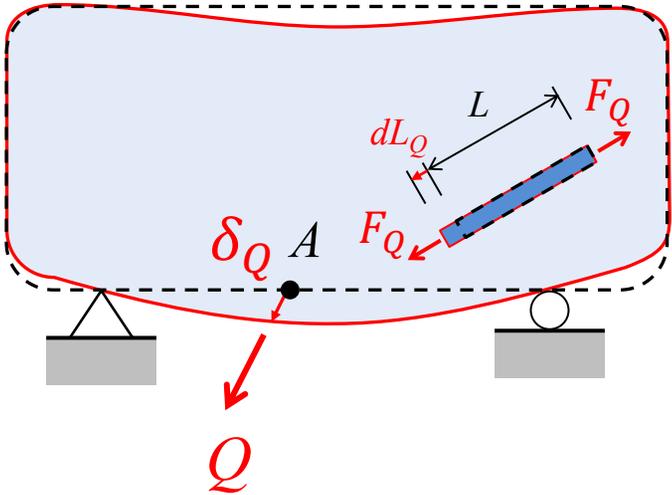
Work is done by a force acting through and in-line displacement

$$W = M\theta$$



Work is done by a moment acting through and in-line rotation

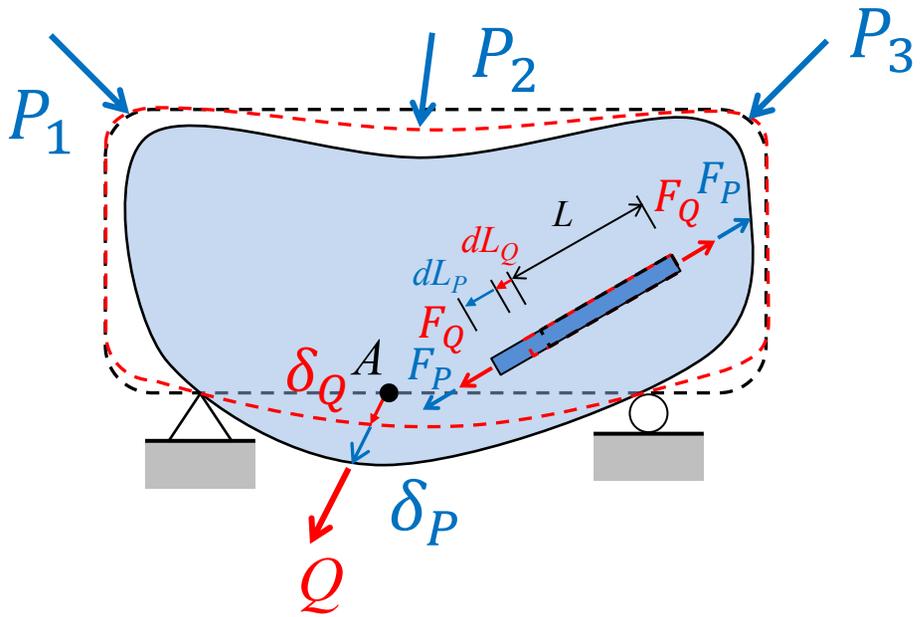
Virtual Work for a General Body



$$U_Q = \iint F_Q dL_P$$

$$W_Q = Q \delta_P$$

Virtual Work for a General Body



$$W_Q = U_Q$$

$$U_Q = \iint F_Q dL_P$$

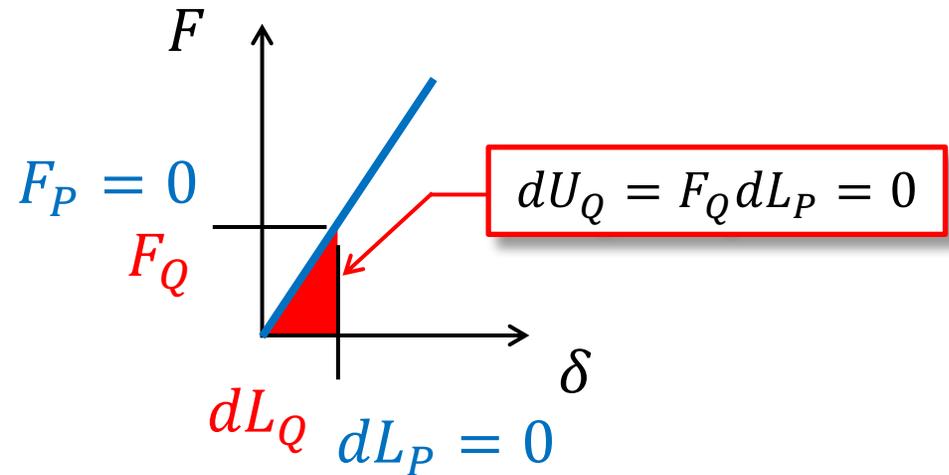
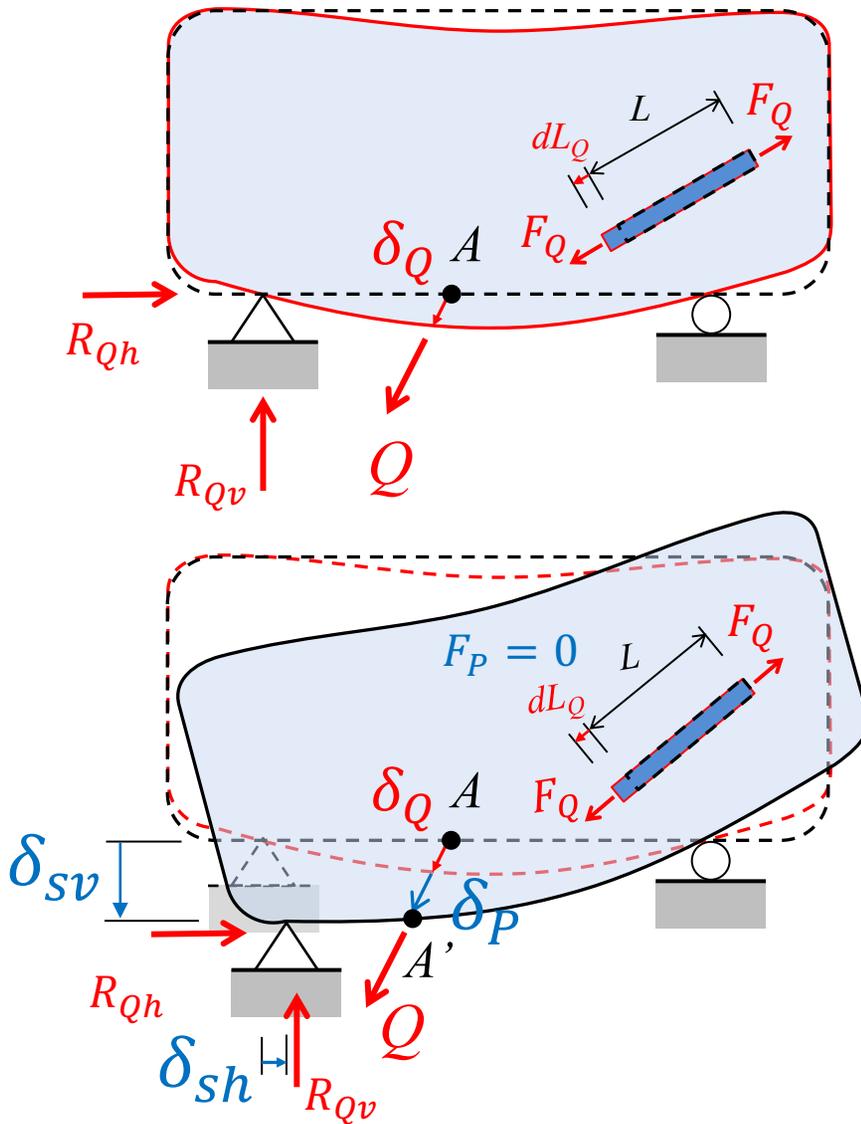
$$W_Q = Q \delta_P$$

Real Deformation

$$Q \delta_P = \iint F_Q dL_P$$

Virtual Loads

Virtual Work for Deflection Due to Support Movement



Real Deformation is Rigid body motion

$$U_Q = 0$$

$$W_Q = Q\delta_P + R_{Qh}\delta_{sh} - R_{Qv}\delta_{sv}$$

In general

$$W_Q = Q\delta_P + \sum R_Q \delta_s$$

General Form of the Principle of Virtual Work

The diagram shows the equation $Q\delta_P + \sum R_Q \delta_s = \iint F_Q dL_P$ enclosed in a light blue box with a red border. A blue line with three downward-pointing arrows originates from the text 'Real Deformation' and points to the terms δ_P , δ_s , and dL_P in the equation. A red line with three upward-pointing arrows originates from the text 'Virtual Loads' and points to the terms Q , R_Q , and F_Q in the equation.

$$Q\delta_P + \sum R_Q \delta_s = \iint F_Q dL_P$$

Real Deformation

Virtual Loads