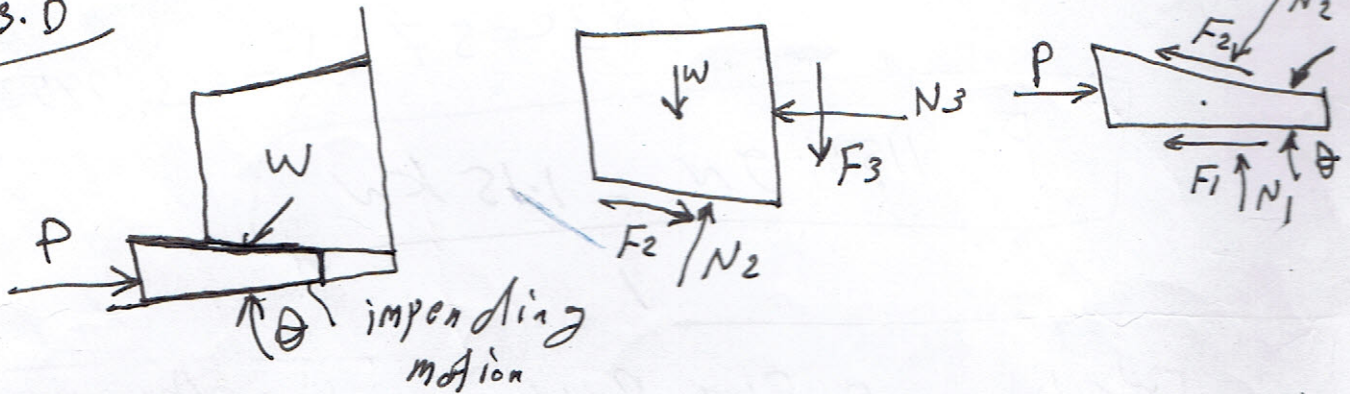


Wedges

A wedge is a simple machine that is often used to transform an applied force into much larger forces.

F.B.D



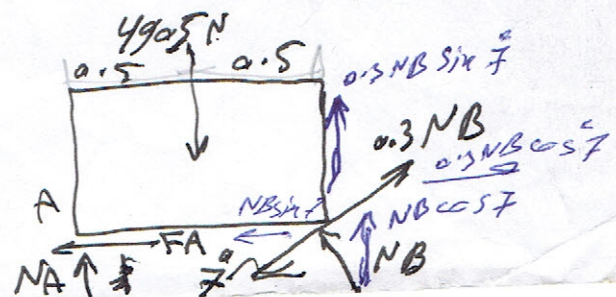
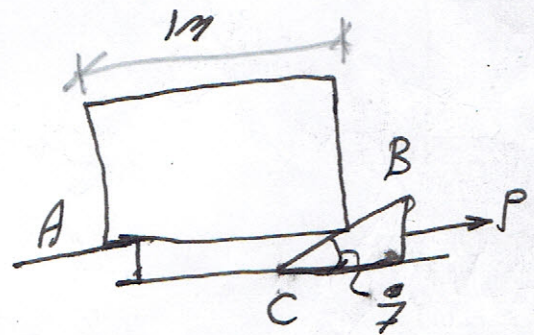
Ex: the uniform stone in has a mass of 500kg and is held in the horizontal position using a wedge at B. if the coefficient of static friction is $\mu_s = 0.3$ at the surface of contact. determine the minimum force (P) needed to remove the wedge. Assume that the stone does not slip at A.

sol: $m \cdot g = 4905 \text{ N}$

$$\sum M_A = 0$$

$$-4905 \times 0.5 + N_B \cos \theta \times 1 + 0.3 N_B \sin \theta \times 1 = 0$$

$N_B = 2383 \text{ N}$



(2)

$$\sum F_y = 0$$

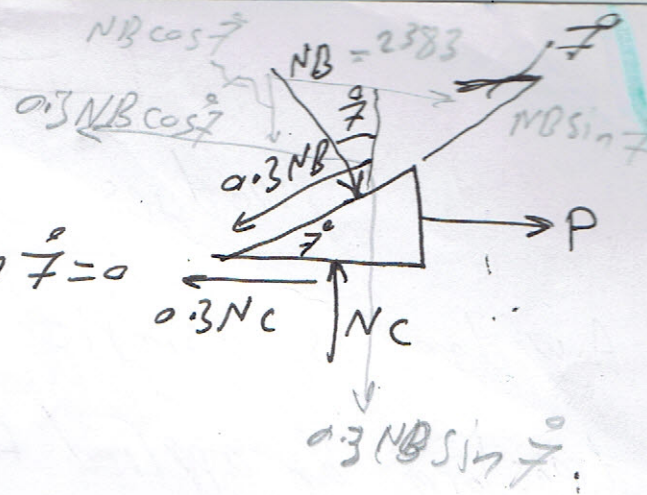
$$N_C - 2383 \cos 7^\circ - 0.3(2383) \sin 7^\circ = 0$$

$$N_C = 2452.5 \text{ N}$$

$$\sum F_x = 0$$

$$2383 \sin 7^\circ - 0.3(2383 \cos 7^\circ) + P - 0.3(2452.5) = 0$$

$$P = 1154.9 \text{ N} = 1.15 \text{ kN}$$



Friction of flat Belts الاحتكاك على الحزام المسطح

$$T_2 = T_1 e^{\mu \beta}$$

$$T_2 > T_1$$

$\mu = \text{الاحتكاك}$
 $\beta = \text{زاوية الالتصاق}$

