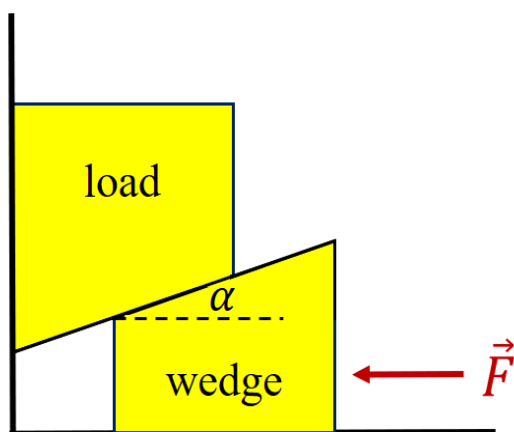


## Section 9.2. Applications

**Note.** Consider:



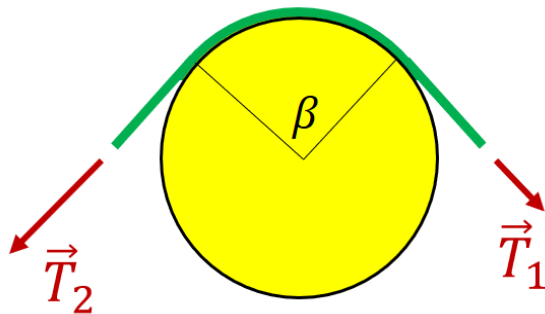
If the load has weight  $w_L$ , the wedge has weight  $w_w$ , and the coefficient of static friction between surfaces is  $\mu_s$ , then

$$F = \mu_s w_w + \frac{(1 - \mu_s^2) \tan \alpha + 2\mu_w}{(1 - \mu_s^2) - 2\mu_s \tan \alpha} w_L$$

(see page 460).

**Example.** Page 465 Number 9.71.

**Note.** Suppose a rope is wrapped through an angle  $\beta$  around a cylinder where the coefficient of static friction is  $\mu_s$ . If a force  $\vec{T}_1$  is applied as follows, then force  $\vec{T}_2$  may be as large as  $T_2 = T_1 e^{\mu_s \beta}$  (see page 479).



Notice that if we increase  $\beta$ , then  $T_2$  increases exponentially. This is an example of *belt friction*.

**Example.** Page 484 Number 9.126.

*Revised: 9/26/2018*