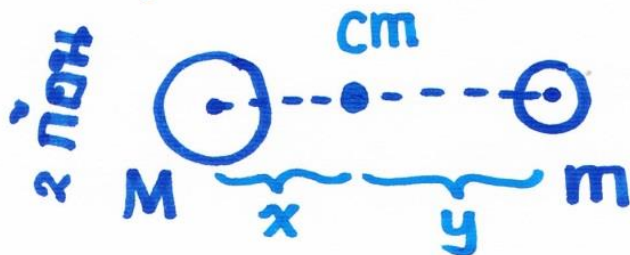


สถิตยศาสตร์

PJMD460J

(1) เงื่อนไข, $\sum \vec{F} = 0$, เงื่อนไข, $\sum \vec{M} = 0$

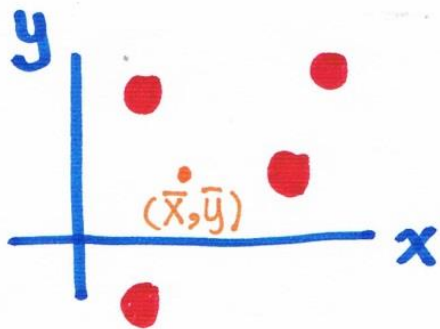
(2) จุดศูนย์กลางมวล



$$m_1 x_1 = m_2 x_2$$

$$Mx = my$$

หลายมวล



$$\bar{x} = \frac{\sum \tilde{x}m}{\sum m} = \frac{\tilde{x}_1 m_1 + \tilde{x}_2 m_2 + \dots}{m_1 + m_2 + \dots}$$

$$\bar{y} = \frac{\sum \tilde{y}m}{\sum m}$$

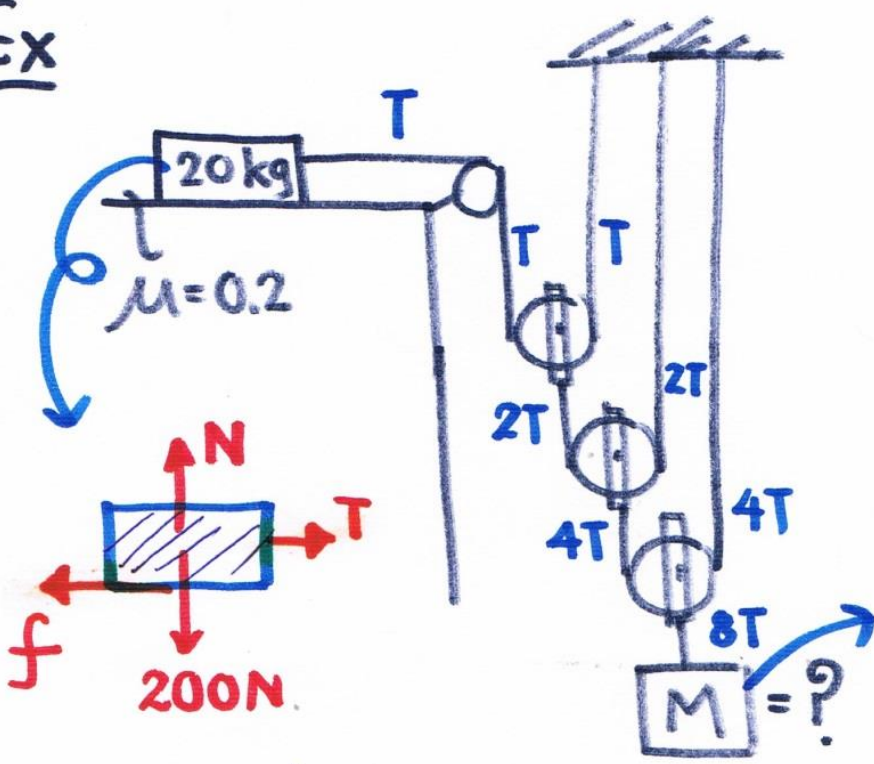
(3) โจทย์สถิตยศาสตร์ $\Rightarrow$ FBD

เลือกพื้นที่
หามุม
สัมพันธ์

$x: \rightarrow = \leftarrow$, $y: \uparrow = \downarrow$

ห้อย
รอก
เชือก
ฝืด

Ex



$x: \rightarrow = \leftarrow$

$T = f = \mu N$

$T = 0.2(200)$

$T = 40 \text{ N} \quad \text{--- (2)}$

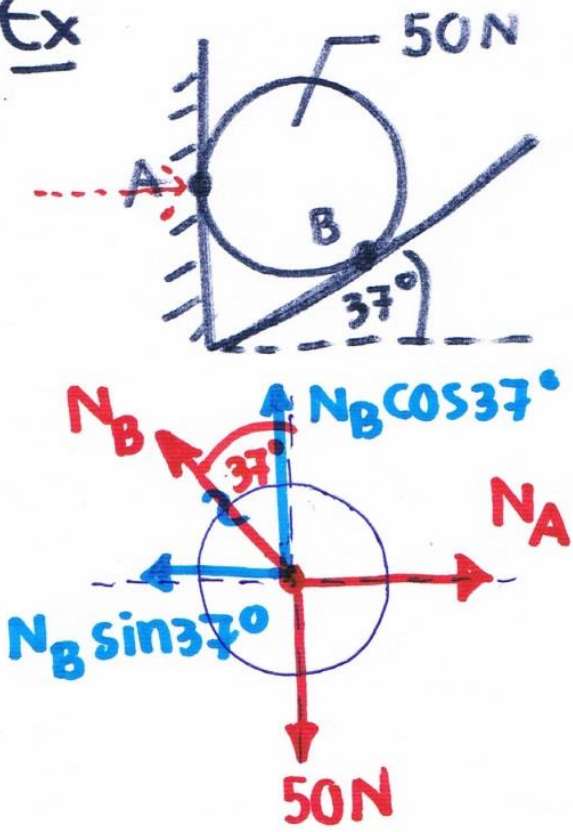
$y: \uparrow = \downarrow$

$8T = Mg \quad \text{--- (1)}$

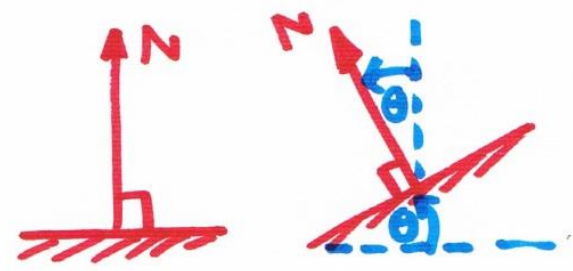
จาก (1); $8(40) = 10M$

$M = 32 \text{ kg} \quad \#$

Ex



หาค่า
 N_A, N_B



เขียน ภาพ
N ค้าง

$y: \uparrow = \downarrow$

$N_B \cos 37^\circ = 50$

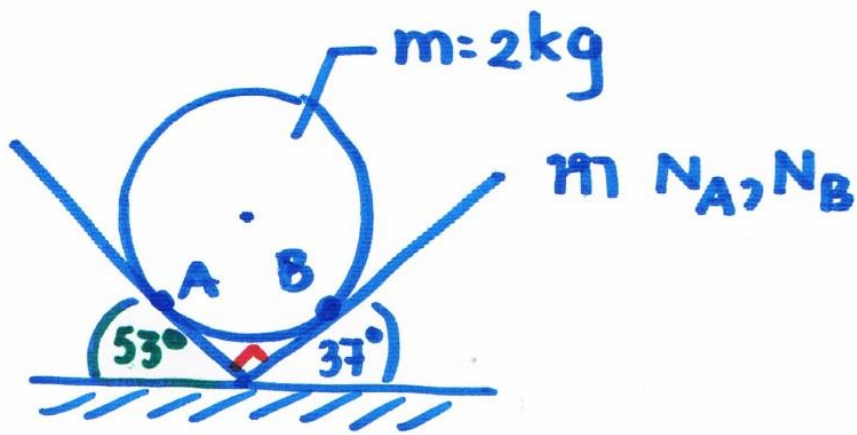
$N_B \left(\frac{4}{5}\right) = 50$

$N_B = \frac{250}{4} = 62.5 \text{ N}$

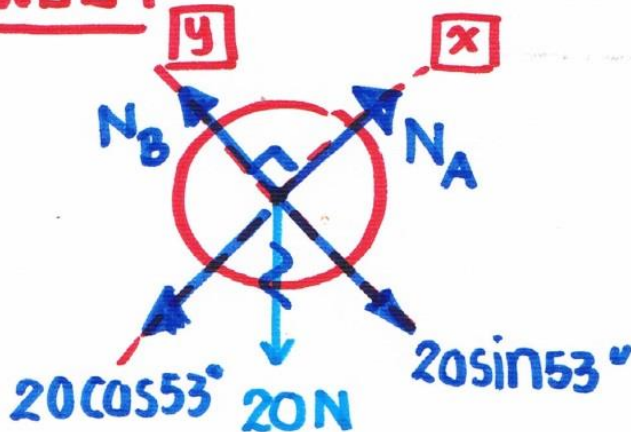
$x: \rightarrow = \leftarrow$

$N_A = N_B \sin 37^\circ = 62.5 \left(\frac{3}{5}\right) = 37.5 \text{ N}$

Ex



แบบที่ 1

x: $\rightarrow = \leftarrow$

$$N_A = 20 \cos 53^\circ$$

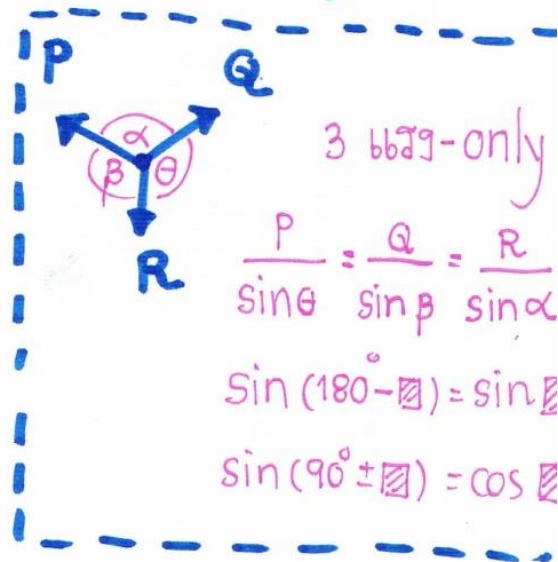
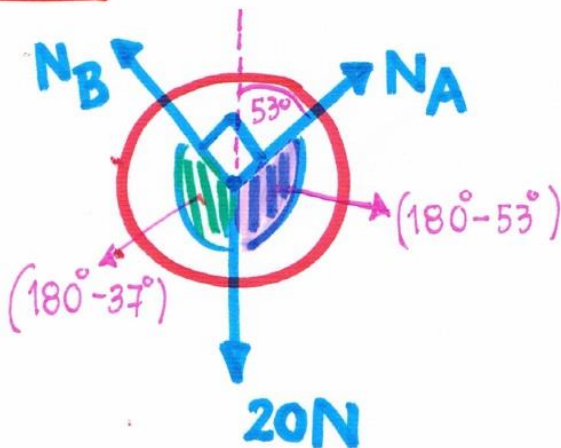
$$= 12 \text{ N} \quad \#$$

y: $\uparrow = \downarrow$

$$N_B = 20 \sin 53^\circ$$

$$= 16 \text{ N} \quad \#$$

แบบที่ 2 Lami's theorem



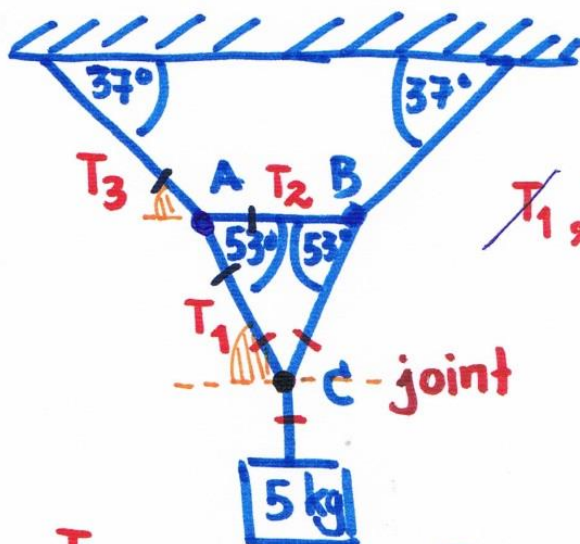
$$\frac{20}{\sin 90^\circ} = \frac{N_A}{\sin (180^\circ - 37^\circ)} = \frac{N_B}{\sin (180^\circ - 53^\circ)}$$

$$20 = \frac{N_A}{\sin 37^\circ} = \frac{N_B}{\sin 53^\circ}$$

$$N_A = 12 \text{ N} \quad , \quad N_B = 16 \text{ N} \quad \#$$

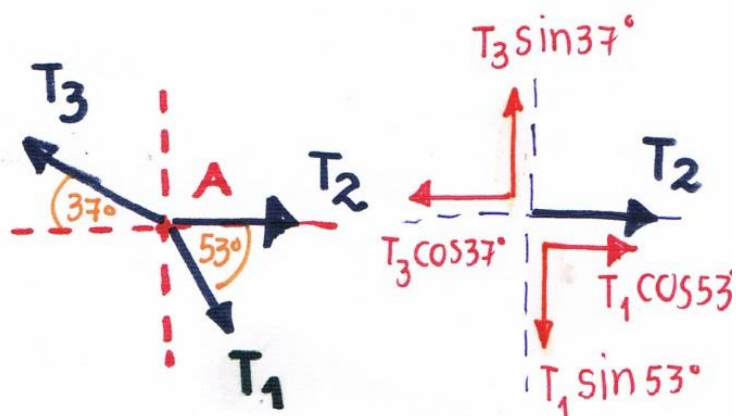
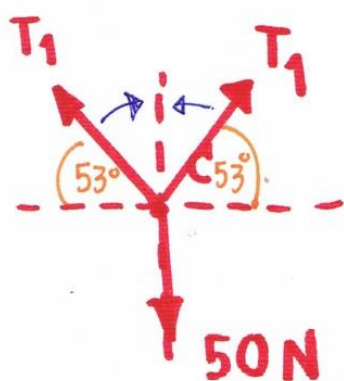
Ex

2



$T_1, T_2, T_3 = ?$

joint



y: $\uparrow = \downarrow$

$$2T_1 \sin 53^\circ = 50$$

$$2T_1 \left(\frac{4}{5}\right) = 50$$

$$T_1 = \frac{250}{8}$$

$$T_1 = 31.25\text{ N} \quad \#$$

y: $\uparrow = \downarrow$

$$T_3 \sin 37^\circ = T_1 \sin 53^\circ$$

$$T_3 \left(\frac{3}{5}\right) = \frac{250}{8} \left(\frac{4}{5}\right)$$

$$T_3 = \frac{250 \times 5}{3} = \frac{125}{3} = 41.67\text{ N}$$

x: $\rightarrow = \leftarrow$

$$T_2 + T_1 \cos 53^\circ = T_3 \cos 37^\circ$$

$$T_2 + \frac{250}{8} \left(\frac{3}{5}\right) = \frac{125}{3} \left(\frac{4}{5}\right)$$

$$T_2 = 14.58\text{ N} \quad \#$$