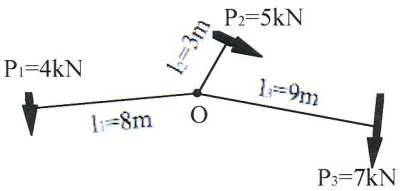
H21 年度　基礎力学及び演習　　担当 岩城・子田　　実施日：2009 年 5 月 25 日

小テスト：モーメントと力の釣り合い

学年　　年　学生番号　　氏名　解答

1．O 点回りのモーメント力を求めよ．

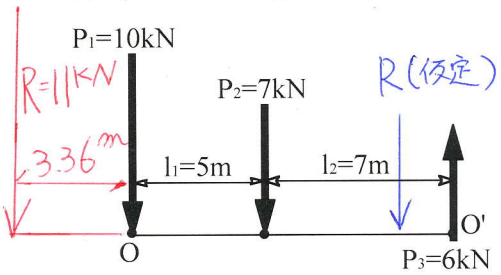


$M_O = -P_1 \times l_1 + P_2 \times l_2 + P_3 \times l_3$

$= -4\,kN \cdot 8\,m + 5\,kN \cdot 3\,m + 7\,kN \cdot 9\,m$

$= 46\,kN \cdot m$

2．合力 R とその作用位置を求め，図示せよ．



$R = -10\,kN - 7\,kN + 6\,kN = -11\,kN$（下向き）

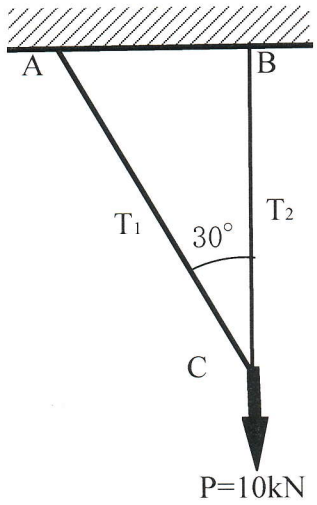
$\Sigma M_O = P_2 \times l_2 - P_3(l_1 + l_2) = R \cdot x$

$x = \dfrac{7\,kN \cdot 5\,m - 6 \times (5\,m + 7\,m)}{11\,kN}$

$= -3.36\,kN$

3．部材力 T_1，T_2 を求めよ．

(1)



a) $\Sigma H = -T_1 \sin 30° = 0$　$T_1 = 0\,kN$

$\Sigma V = -T_2 - T_1 \cos 30° + P = 0$

$T_2 = P = 10\,kN$

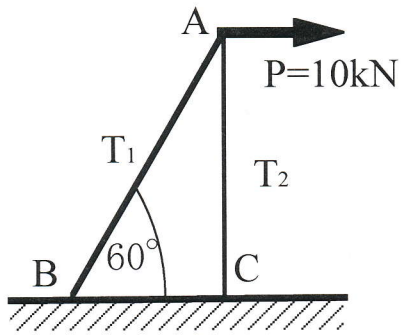
b) $\Sigma M_A = P \times AC \sin 30° - T_2 \times AC \sin 30° = 0$

$T_2 = P = 10\,kN$

$\Sigma M_B = T_1 \times BC \sin 30° = 0$

$T_1 = 0\,kN$

(2)



a) $\Sigma H = P - T_1 \cos 60° = 0$

$T_1 = \dfrac{P}{\cos 60°} = 20\,kN$

$\Sigma V = -T_2 - T_1 \sin 60° = 0$

$T_2 = -T_1 \sin 60° = -17.3\,kN$

b) $\Sigma M_C = -T_1 \times AC \cos 60° + P \times AC = 0$

$T_1 = P / \cos 60°$

$= 20\,kN$

$\Sigma M_B = T_2 \times AB \cos 60° + P \times AB \sin 60° = 0$

$T_2 = \dfrac{-P \times \sin 60°}{\cos 60°} = -17.3\,kN$