[3.1절]

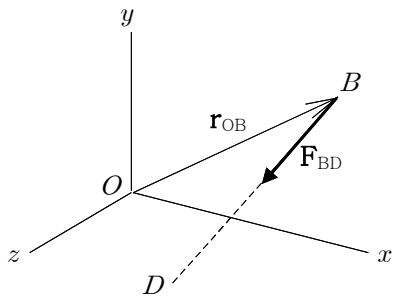
3.32　T_{BD} = 900 N, B(2.5m, 2m, 0), D(1.5m, 0, 2m)

S; given T_{BD}, B, D,　required d

⇒ 점 O에 관한 모멘트의 크기

= 장력 T_{BD} × 수직거리 d

M; 자유물체도(F.B.D.)



A; ① 위치벡터　$\mathbf{r}_{OB}$ 또는 $\mathbf{r}_{OD}$

$\mathbf{r}_{OB}$ = 2.5 **i** − 2 **j**　(m)

② 힘벡터

$BD = \sqrt{(-1)^2+(-2)^2+2^2}$ m = 3.00 m

$\boldsymbol{\lambda}_{BD} = \frac{1}{3.00}$ (−1 **i** − 2 **j** + 2 **k**)

$\mathbf{F}_{BD} = T_{BD}\,\boldsymbol{\lambda}_{BD} = \frac{900\,\text{N}}{3.00}$ (−1 **i** − 2 **j** + 2 **k**) = −300 **i** − 600 **j** + 600 **k**　(N)

③ 벡터곱

$\mathbf{M}_O = \mathbf{r}_{OB} \times \mathbf{F}_{BD}$

= [2.5 **i** − 2 **j**　(m)] × [−300 **i** − 600 **j** + 600 **k**　(N)]

= [(−2)(600) − 0] **i** + [0 − (2.5)(600)] **j** + [(2.5)(600) − (−2)(−300)] **k**　(N㎜)

= 1,200 **i** − 1,500 **j** − 900 **k**　(N㎜)

④ $M_O = \sqrt{1{,}200^2+(-1{,}500)^2+(-900)^2}$ (N㎜) = 2,121 (N㎜)

$M_O = T_{BD}\,d$

⇒　$d = \frac{M_O}{T_{BD}} = \frac{2{,}121\,\text{N}\cdot\text{m}}{900\,\text{N}}$ = 2.357 m　　⇒　　d = 2.36 m

R(과정의 타당성) : (가령, 위치벡터 $\mathbf{r}_{OB}$ 또는 $\mathbf{r}_{OD}$)

T(결과의 의미) : (가령, $d<OB$, $d<OD$, 수직거리가 최단)