

S02 Statics of Particles

1	$F_A = 439 \text{ N}$ $F_B = 311 \text{ N}$
2	$F_1 = 275 \text{ N}$ $\theta = 29.1^\circ$
3	$F_{AB} = 29.4 \text{ kN}$ $F_{BC} = 15.2 \text{ kN}$ $F_{BD} = 21.5 \text{ kN}$
4	$T = 14.3 \text{ kN}$ $\theta = 36.3^\circ$

S03 Equivalent Systems of Forces

1	$M_A = 38.18 \text{ kN} \cdot \text{m} \uparrow \downarrow$
2	Not Applicable
3	$F_R = 542 \text{ N}$ $\theta = 10.6^\circ \nearrow \searrow$ $d = 827 \text{ mm}$ (from A)
4	$F_R = 1.25 \text{ kN}$ $x = 8.00 \text{ m}$ (from A)

S04 Equilibrium of Rigid Bodies

1	$\theta = 26.4^\circ$
2	$A_x = 20.8 \text{ kN} \rightarrow$ $A_y = 87.7 \text{ kN} \uparrow$ $T = +34.62 \text{ kN}$
3	$A_x = 3.60 \text{ kN} \rightarrow$ $A_y = 1.80 \text{ kN} \downarrow$ $N_B = 5.09 \text{ kN} \nearrow \searrow$
4	$C_x = 2.66 \text{ kN} \leftarrow$ $C_y = 6.56 \text{ kN} \downarrow$ $F_{AB} = +0.864 \text{ kN}$

S05 Analysis of Structures

1	$F_{DC} = -1.34 \text{ kN}$ $F_{DE} = +1.2 \text{ kN}$ $F_{CE} = 0 \text{ kN}$ $F_{CB} = -1.34 \text{ kN}$ $F_{EB} = -1.27 \text{ kN}$ $F_{EA} = +2.1 \text{ kN}$
2	$F_{CD} = -1.92 \text{ kN}$ $F_{GF} = +1.53 \text{ kN}$ $F_{FD} = F_{FC} = 0$
3	$F_{KJ} = -18.0 \text{ kN}$ $F_{KC} = -7.5 \text{ kN}$ $F_{BC} = +15.0 \text{ kN}$
4	$B_x = 220 \text{ N} \leftarrow$ $B_y = 220 \text{ N} \uparrow$ $A_x = 300 \text{ N} \leftarrow$ $A_y = 80.4 \text{ N} \uparrow$

S06 Centroids and Centers of Gravity

1	$A = \frac{1}{3}ah \quad \bar{x} = \frac{3}{4}a \quad \bar{y} = \frac{3}{10}h$
2	$A = \frac{1}{2}\pi(r_o^2 - r_i^2) \quad \bar{x} = \frac{4(r_o^3 - r_i^3)}{3\pi(r_o^2 - r_i^2)} \quad \bar{y} = 0$
3	$A = \left(1 + \frac{\sqrt{3}}{4}\right)a^2 \quad \bar{x} = 0 \quad \bar{y} = -0.262a$

S07 Moments of Inertia

1	$I_x = 0.533 \text{ m}^4 \quad I_y = 2.67 \text{ m}^4$
2	$I_x = 0.2051 \text{ m}^4 \quad I_y = 0.2857 \text{ m}^4$ $I_o = 0.491 \text{ m}^4$
3	$I_x = 798(10^6) \text{ mm}^4 \quad I_y = 10.3(10^9) \text{ mm}^4$
4	$I_{xy} = 3.12 \text{ m}^4$