HARSHEL. MALAWADE
2GI20EC046
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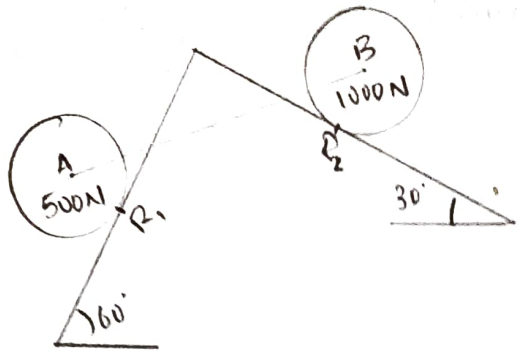


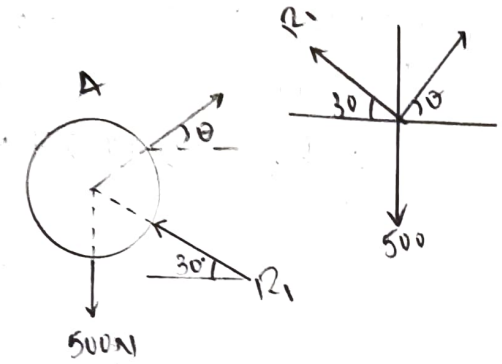


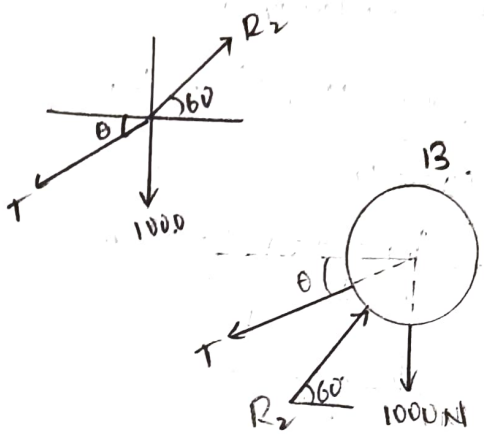


$\Sigma F_x = 0.$

$T\cos\theta - R_1\cos 30 = 0$

$T\cos\theta = R_1\cos 30$

$\Sigma F_y = 0$

$T\sin\theta + R_1\sin 30 - 500 = 0$

$500 = T\sin\theta + \frac{T\cos\theta \sin 30}{\cos 30}$

$500 = T(\sin\theta + 0.5773\cos\theta) - ①$

$\Sigma F_x = 0$

$-T\cos\theta + R_2\cos 60^\circ = 0$

$R_2\cos 60 = T\cos\theta$

$\Sigma F_y = 0$

$1000 = R_2\sin 60 - T\sin\theta$

$1000 = \frac{T\cos\theta \sin 60}{\cos 60} - T\sin\theta$

$1000 = T[(1.7320)\cos\theta - \sin\theta] - ②$

$$\frac{500}{1000} = \frac{\sin\theta + 0.5773\cos\theta}{1.7320\cos\theta - \sin\theta}$$

$1.7320\cos\theta - \sin\theta = 2\sin\theta + 1.1546\cos\theta$

$1.7320\cos\theta - 1.1546\cos\theta = 3\sin\theta$

$\cos\theta(0.5774) = 3\sin\theta$

$\frac{0.5774}{3} = \tan\theta$

$\tan\theta = 0.1924$

$\therefore \theta = \tan^{-1}(0.1924) = 10.89^\circ //$

Put $\theta = 10.89^\circ$ in equation (1).

$500 = T(\sin 10.89 + 0.5773 \cos 10.89)$

$500 = T(0.1889 + 0.5669)$

$500 = T(0.7558)$

$T = 661.55\ N$ //

$T\cos\theta = R_1 \cos 30$

$\frac{661.55 \cos(10.89)}{\cos 30} = R_1$

$\therefore R_1 = 750.13\ N$ //

$T\cos\theta = R_2 \cos 60$

$\frac{661.55 \cos(10.89)}{\cos 60} = R_2$

$\therefore R_2 = 1299.27\ N$ //