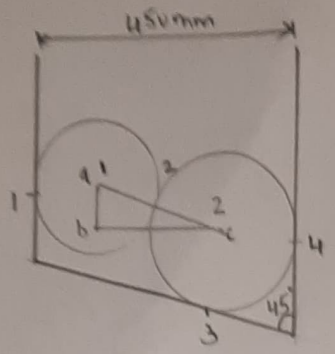
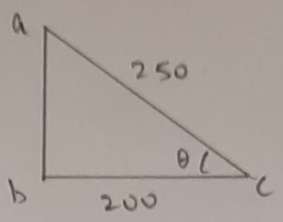
HARSHEL. D. MALAWADE
2GI20ECO46
I36.



Sphere 1
r = 100mm
W = 750N

Sphere 2
r = 150mm
W = 1000N



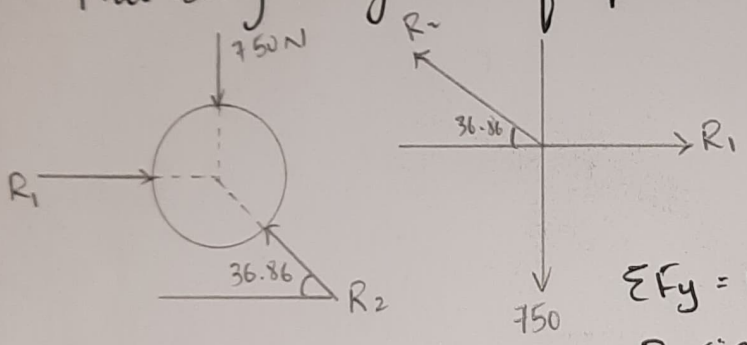
$ac = 150 + 100$

$bc = 450 - 150 - 100$

$= 200.$

$\theta = \cos^{-1}\left(\frac{20}{25}\right) = 36.86^\circ.$

Free Body Diagram of Sphere ①.



$\Sigma F_x = 0$

$R_1 - R_2 \cos 36.86 = 0$

$R_1 = R_2(0.8)$ — ①

$\Sigma F_y = 0.$

$R_2 \sin 36.86 - 750 = 0$

$R_2 = 750 / \sin 36.86$

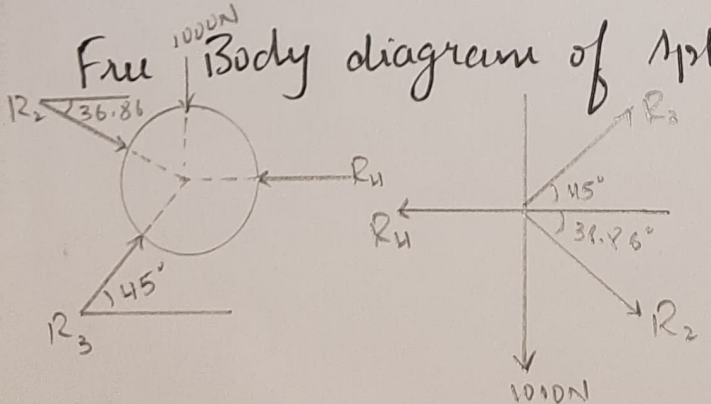
$\therefore R_2 = 1250.2\,N$ //

Put R_2 in eq^n ①.

$R_1 = 1250.2(0.8)$

$\therefore R_1 = 1000.16\,N$ //

Free Body diagram of Sphere ②



$\Sigma F_x = 0$

$-R_4 R_3 \cos 45^\circ - R_4 + R_2 \cos 36.86 = 0$

$R_4 = R_3 \cos 45^\circ + 1250.2(0.8)$

$R_4 = R_3 \cos 45^\circ + 1000.16$ — ②.

$\Sigma F_y = 0$

$R_3 \sin 45 - 1000 - R_2 \sin 36.86 = 0$

$R_3 \sin 45 - 1000 - 1250.2(0.59) = 0$

$R_3 \sin 45 = 1737.618$

$R_3 = \frac{1000 + 1250.2 \sin 36.86}{\sin 45}$

$\therefore R_3 = 2474.8\,N$ //

Put R_3 in equation (2)

$$R_4 = 2474.8 \cos 45^\circ + 1000.16$$

$$\therefore R_4 = 2750.10 \text{ N} //$$