$$R_1 = \frac{F}{4}\left(\cos\frac{\pi}{2}\left(\sin^2\frac{\pi}{2}-1\right) - \cos 0\left(\sin^2 0 - 1\right)\right)$$

$$\boxed{R_1 = \frac{F}{4}}$$

Il faut maintenant calculer la distance d'application d :

$$d = \frac{1}{R_1}\int_0^{\frac{\pi}{2}} p \sin\theta \,.\, R.\cos\theta . ds \qquad p = k\cos^2\theta \quad k = \frac{3F}{4\ell R}$$

$$ds = R\,d\theta . \ell .$$

$$d = \frac{1}{R_1}\int_0^{\frac{\pi}{2}} \frac{3F}{4\ell . R}\cos^2\theta \sin\theta \,.\, R\cos\theta \,.\, R . d\theta . \ell$$

$$d = \frac{1}{R_1}\int_0^{\frac{\pi}{2}} \frac{3F . R^{\cancel{2}}\cancel{\ell}}{4\cancel{\ell} . \cancel{R}} \,.\, \cos^3\theta \sin\theta \, d\theta$$

$$d = \frac{3FR}{4R_1}\int_0^{\frac{\pi}{2}} \cos^3\theta \sin\theta \, d\theta$$

$$d = \frac{3FR}{4R_1} \cdot \left[\frac{1}{4}\sin^2\theta . \cos^2\theta + \frac{2}{4}\int_0^{\frac{\pi}{2}} \sin\theta \cos\theta \, d\theta\right]_{-\frac{\pi}{2}}^{+\frac{\pi}{2}}$$

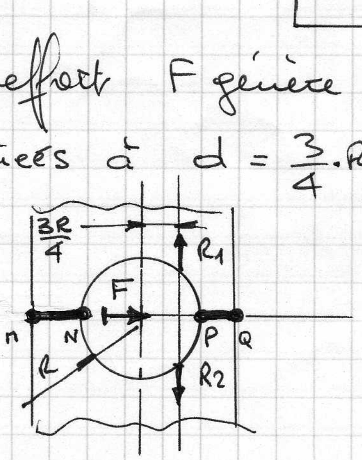
$$d = \frac{3FR}{16R_1}\left[\sin^2\theta \cos^2\theta + 2\left[\frac{1}{2}\sin^2\theta . \underbrace{\cos^0\theta}_{=1} + 0\right]_0^{+\frac{\pi}{2}}\right]_0^{+\frac{\pi}{2}}$$

$$d = \frac{3FR}{16R_1} . \left[\underset{1}{\sin^2\frac{\pi}{2}}\ \underset{0}{\cos^2\frac{\pi}{2}} - \underset{0}{\sin^2 0 \cos^2 0} + \underset{2}{2}\left(\underset{\frac{1}{2}}{\frac{1}{2}}\underset{1}{\sin^2\frac{\pi}{2}} - \frac{1}{2}\underset{0}{\sin^2 0}\right)\right]$$

$d = \dfrac{3FR}{16R_1}$ avec $R_1 = \dfrac{F}{4}$ on obtient

$$\boxed{d = \frac{3}{4}R}$$

Un effort F génère donc deux réactions $R_1 = R_2 = \dfrac{F}{4}$ situées à $d = \dfrac{3}{4}$. Rayon



R_1 et R_2 s'appliquent sur MN et PQ