

$$\frac{1}{10} \quad \underline{F} = \underline{F}_n = F \left(\frac{-4\hat{i} - 2\hat{j}}{\sqrt{4^2 + 2^2}} \right),$$

$$\text{where } F = \frac{G m_{cu} m_{st}}{d^2}$$

$$= \frac{G \left(\rho_{cu} \frac{4}{3} \pi r^3 \right) \left(\rho_{st} \frac{4}{3} \pi \left(\frac{r}{2} \right)^3 \right)}{(4r)^2 + (2r)^2}$$

$$= \frac{1}{90} G \rho_{cu} \rho_{st} \pi^2 r^4$$

$$= \frac{1}{90} (6.673 \cdot 10^{-11}) (8910) (7830) \pi^2 (0.050)^4$$

$$= 3.19 (10^{-9}) \text{ N}$$

$$\begin{aligned} \text{Then } \underline{F} &= 3.19 (10^{-9}) \left[\frac{-4\hat{i} - 2\hat{j}}{\sqrt{20}} \right] \\ &= (-2.85\hat{i} - 1.427\hat{j}) 10^{-9} \text{ N} \end{aligned}$$

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