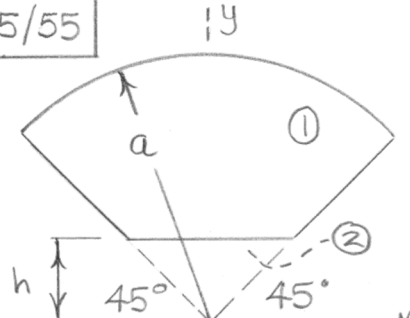


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Circular sector (full) ①:

$$A_1 = \frac{\pi}{4} a^2$$

$$\bar{y}_1 = \frac{2}{3} a \frac{\sin 45^\circ}{\pi/4}$$

$$= \frac{4\sqrt{2}}{3\pi} a$$

Triangular "hole" ②:

$$A_2 = \frac{1}{2} h (2h) = h^2, \quad \bar{y}_2 = \frac{2}{3} h$$

$$\bar{Y} = \frac{\sum A \bar{y}}{\sum A} = \frac{\frac{\pi}{4} a^2 \left(\frac{4\sqrt{2}}{3\pi} a \right) - h^2 \left(\frac{2}{3} h \right)}{\frac{\pi}{4} a^2 - h^2}$$

$$= \frac{4(\sqrt{2} a^3 - 2h^3)}{3(\pi a^2 - 4h^2)}$$

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