

A/49

Sol. I

$I_{\textcircled{1}} = 2 \left[\frac{1}{12} 4a(a^3) + 4a^2 \left(\frac{3a}{2} \right)^2 \right] = \frac{56}{3} a^4$

Diagram for Sol. I: A cross-section consisting of a top horizontal rectangle (labeled ①) with width $4a$ and height a , and a central vertical rectangle (labeled ②) with width a and height $2a$. A dashed line represents the x' -axis at the top of the vertical rectangle. Another dashed line represents the x -axis at the bottom of the vertical rectangle.

$I_{\textcircled{2}} = \frac{1}{12} a (2a)^3 = \frac{2}{3} a^4$

Total $I_x = \frac{58}{3} a^4$

Sol. II

Diagram for Sol. II: A square with side length $4a$. The central vertical rectangle (labeled ②) is shown with dashed lines. The two side rectangular regions (labeled ①) are also shown with dashed lines. A dashed line represents the x -axis at the bottom of the square.

$I_{\textcircled{1}} = \frac{1}{12} (4a)(4a)^3 = \frac{64}{3} a^4$

$I_{\textcircled{2}} = -\frac{1}{12} (3a)(2a)^3 = -2a^4$

Total $I_x = \left(\frac{64}{3} - \frac{6}{3} \right) a^4 = \frac{58}{3} a^4$

WILEY