



Without square hole:

$$I_z = 2I_x = 2 \left(\frac{1}{4} \pi R^2 \cdot R^2 \right) = \underline{1.571 R^4}$$

With hole:

$$I_z = 1.571 R^4 - 2 \left(\frac{1}{12} R \cdot R^3 \right) = \underline{1.404 R^4}$$

(a reduction of 10.61%)

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