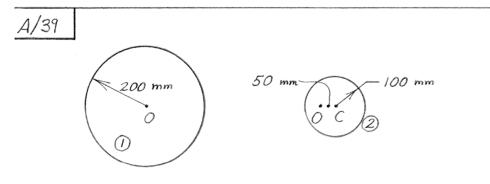
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Area
$$A = A_1 - A_2 = \pi (200^2 - 100^2) = 3(10^4)\pi \text{ mm}^2$$

① $I_{o_1} = \frac{1}{2} (\pi \cdot 200^2)(200^2) = 8(10^8)\pi \text{ mm}^4$

② $I_{o_2} = \frac{1}{2} (\pi \cdot 100^2)(100^2) + \pi (100^2)(50^2) = 0.75(10^8)\pi \text{ mm}^4$
 $So I_o = I_{o_1} - I_{o_2} = 7.25(10^8)\pi \text{ mm}^4$
 $k_o = \sqrt{I_o/A} = \sqrt{\frac{7.25(10^8)\pi}{3(10^4)\pi}} = \frac{155.5 \text{ mm}}{3(10^4)\pi}$

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