

Knowns:

$$f = 100 \text{ mm}$$

$$d_o = 103 \text{ mm}$$

Find:

$$d_i$$

Use lens equation:

$$\frac{1}{f} = \frac{1}{d_o} + \frac{1}{d_i}$$

$$\frac{1}{f} - \frac{1}{d_o} = \frac{1}{d_i}$$

$$\frac{1}{d_i} = \frac{1}{f} - \frac{1}{d_o} = \frac{1}{100 \text{ mm}} - \frac{1}{103 \text{ mm}} = \frac{0.01}{\text{mm}} - \frac{0.00971}{\text{mm}} = \frac{0.00029}{\text{mm}}$$

So

$$\frac{1}{d_i} = \frac{0.00029}{\text{mm}}$$

which means that

$$d_i = \frac{1 \text{ mm}}{0.00029} = 3448 \text{ mm} = 3.45 \text{ m}$$

Alternatively, combine by finding common denominator:

$$\frac{1}{d_i} = \frac{1}{f} - \frac{1}{d_o} = \frac{d_o - f}{f \cdot d_o}$$

So

$$\frac{1}{d_i} = \frac{d_o - f}{f \cdot d_o}$$

Which means that

$$d_i = \frac{f \cdot d_o}{d_o - f} = \frac{(100 \text{ mm})(103 \text{ mm})}{103 \text{ mm} - 100 \text{ mm}} = \frac{10300 \text{ mm} \cdot \text{mm}}{3 \text{ mm}} = \frac{10300}{3} \text{ mm} \approx 3433 \text{ mm} = 3.43 \text{ m}$$

Consistent with above to rounding.