A photographer wishes to take a picture of a (gender independent) bathing beauty unnoticed from a distance of 80 m. If the person is 2 m long and the image on the film is to be 1 cm, what focal length lens should be used?

\[ m = - \frac{i}{\rho} = - \frac{1}{200} \]

\[ \uparrow \text{ image inverted for positive lens} \]

\[ i = \frac{\rho}{200} = \frac{8000 \text{ cm}}{200} \]

\[ = 40 \text{ cm} \]

\[ \frac{1}{i} + \frac{1}{\rho} = \frac{1}{f} \]

\[ \frac{1}{40 \text{ cm}} + \frac{1}{8000 \text{ cm}} = \frac{1}{f} \]

\[ f = 39.8 \text{ cm} \]

\[ = 398 \text{ mm} \]