Find the location of the image if an object 2 cm in height is 5.0 cm in front of a concave mirror of focal length 10.0 cm. How large is the image?

Mirror magnification:

$$m = \frac{h_i}{h_o} = -\frac{d_i}{d_o} \rightarrow h_i = -h_o \frac{d_i}{d_o}$$

Where d – distance, h - height. Indexes i and o corresponds to the image and object respectively.

Mirror equation:

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

Thus:

$$h_i = -h_o \frac{\frac{f d_o}{d_o - f}}{d_o} = h_o \frac{f}{f - d_o}$$

$$h_i = 0.02 * \frac{0.1m}{0.1m - 0.05m} = 0.04m$$

Answer: $h_i = 0.04m$