6. a) The equation expressing the relationship of the image distance, the object distance and the focal length is given as

$$1 / o + 1 / i = 1 / f$$

$$1 / (8 \text{ cm}) + 1 / i = 1 / (15 \text{ cm})$$

$$0.125 \text{ cm}^{-1} + 1 / i = 0.067 \text{ cm}^{-1}$$

We subtract 0.0125 cm^{-1} from each side of the equation to obtain

$$1 / i = (0.067 - 0.125) \text{ cm}^{-1}$$

$$1 / i = - 0.058 \text{ cm}^{-1}$$

Now we multiply both sides of the equation by i to obtain

$$1 = (i) (- 0.058 \text{ cm}^{-1})$$

Next we divide both sides of the equation by $- 0.058 \text{ cm}^{-1}$ to obtain

$$i = 1 / (- 0.058 \text{ cm}^{-1})$$

$$i = - 17.24 \text{ cm}$$

This tells us that the image is located 17.24 cm from the lens on the same side of the lens as the object, as shown in Figure 16.17 on page 324 in the text.

b) The image is virtual. It is located behind the lens, and no real light rays intersect to form the image.

c) The magnification is calculated as $m = - i / o$

$$m = - (- 17.24 \text{ cm}) / (8 \text{ cm})$$

$$m = 2.16$$

The image is 2.16 times as large as the object, so it is enlarged. It is erect, because the magnification is positive.