34-5 \[ \frac{1}{s} + \frac{1}{s'} = \frac{1}{f} = \frac{2}{R} \] (Eqn. (34.16), p. 1305) Concave reflector

\[ s = +16.5\text{ cm} \] Object on same side of mirror as incoming light

\[ s' = ? \]

\[ f = \frac{R}{2} = \frac{22.0\text{ cm}}{2} = 11.0\text{ cm} \]

\[ \text{The rays 1, 2, 3, 4, etc. are numbered in the usual way as described on p. 1297} \]

\[ \frac{1}{s} + \frac{1}{s'} = \frac{1}{11.0\text{ cm}} \]

\[ s' = +33.0\text{ cm} \]

\[ \frac{1}{s} = \frac{1}{11.0\text{ cm}} - \frac{1}{16.5\text{ cm}} = 0.0909\text{ cm}^{-1} - 0.0606\text{ cm}^{-1} = 0.0303\text{ cm}^{-1} \]

\[ s' = 33.0\text{ cm} \] Image is positive so must be on same side of mirror as outgoing light.

8 Position of +33.0 cm for image

Image is inverted and real from ray trace diagram above

Size is given by Eqn. (34.7) p. 1293

\[ m = \frac{y'}{y} = -\frac{s'}{s} = -\frac{(33.0\text{ cm})}{(16.5\text{ cm})} = -2.00 \]

So image is twice as big as object or [1.2 cm] high, but it's inverted.

Note: object is between C and f so this will always give magnified, real, inverted images. See Fig. 34.18, p. 1299.