Multiple Lenses Exercises
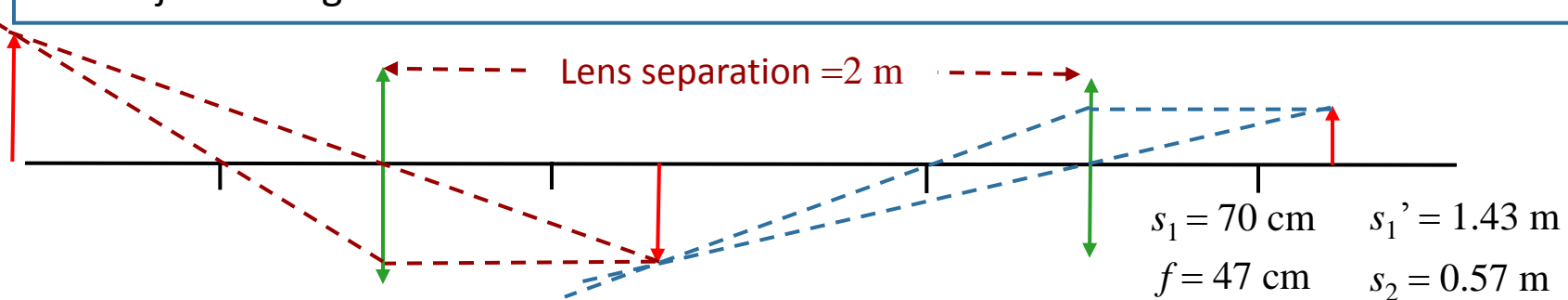
Two converging lenses are set up as shown. The focal length of each lens is 47 cm. The object is a light bulb located 70 cm in front of the first lens.

Lens separation = 2 m

$s_1 = 70$ cm $s_1' = 1.43$ m

$f = 47$ cm $s_2 = 0.57$ m

What is the nature of the FINAL image in terms of the ORIGINAL object?

A) REAL
   UPRIGHT

B) REAL
   INVERTED

C) VIRTUAL
   UPRIGHT

D) VIRTUAL
   INVERTED

EQUATIONS

$$S_2' = \frac{fs_2}{s_2 - f}$$

$s_2 > f$ $\longrightarrow$ $s_2' > 0$ $\longrightarrow$ real image

$$M_2 = -\frac{S_2'}{S_2}$$ $\longrightarrow$ $M_2 < 0$ $\longrightarrow$ $M = M_1 M_2 > 0$

$\longrightarrow$ upright image

PICTURES

Draw Rays as above.

RESULTS

$s_2' = 2.69$ m

$M = 9.6$