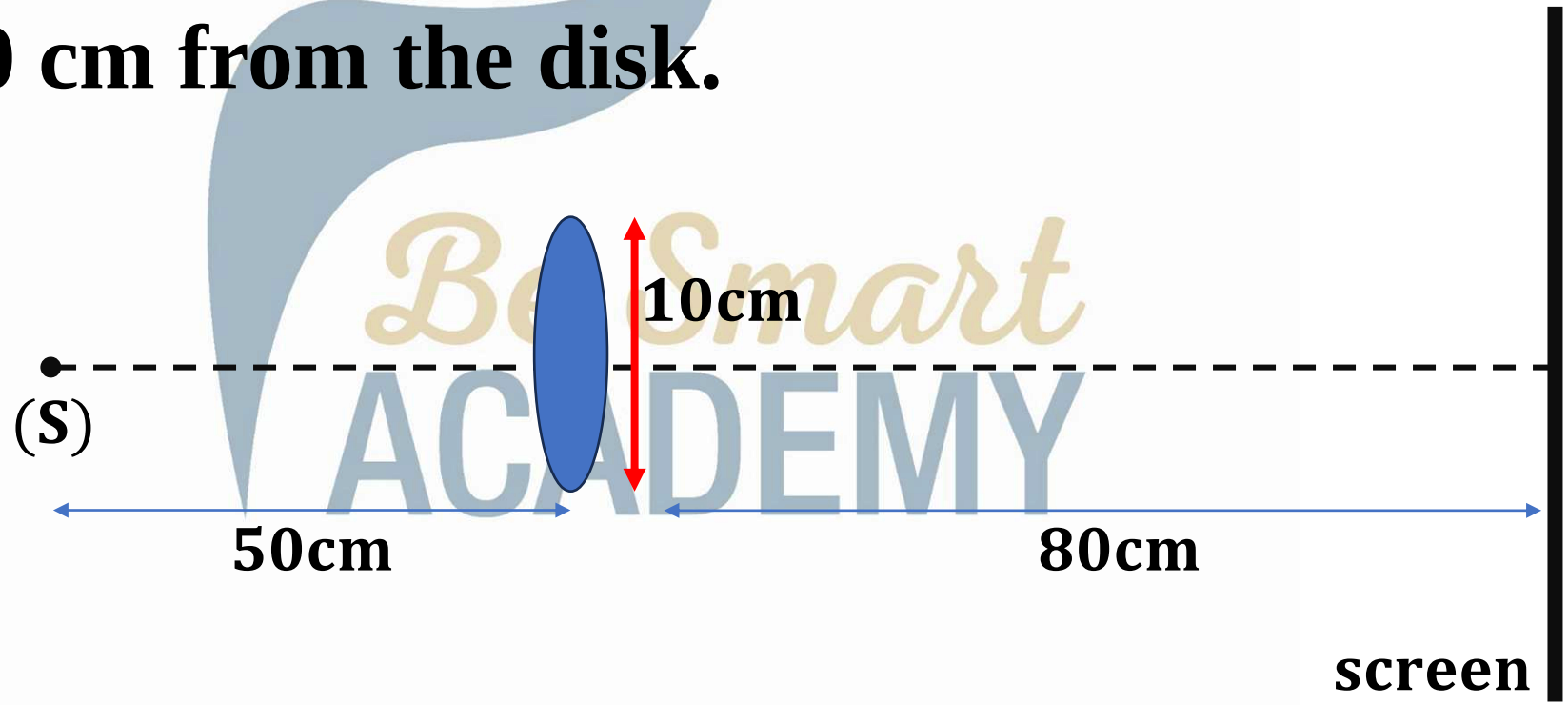
Think then Solve

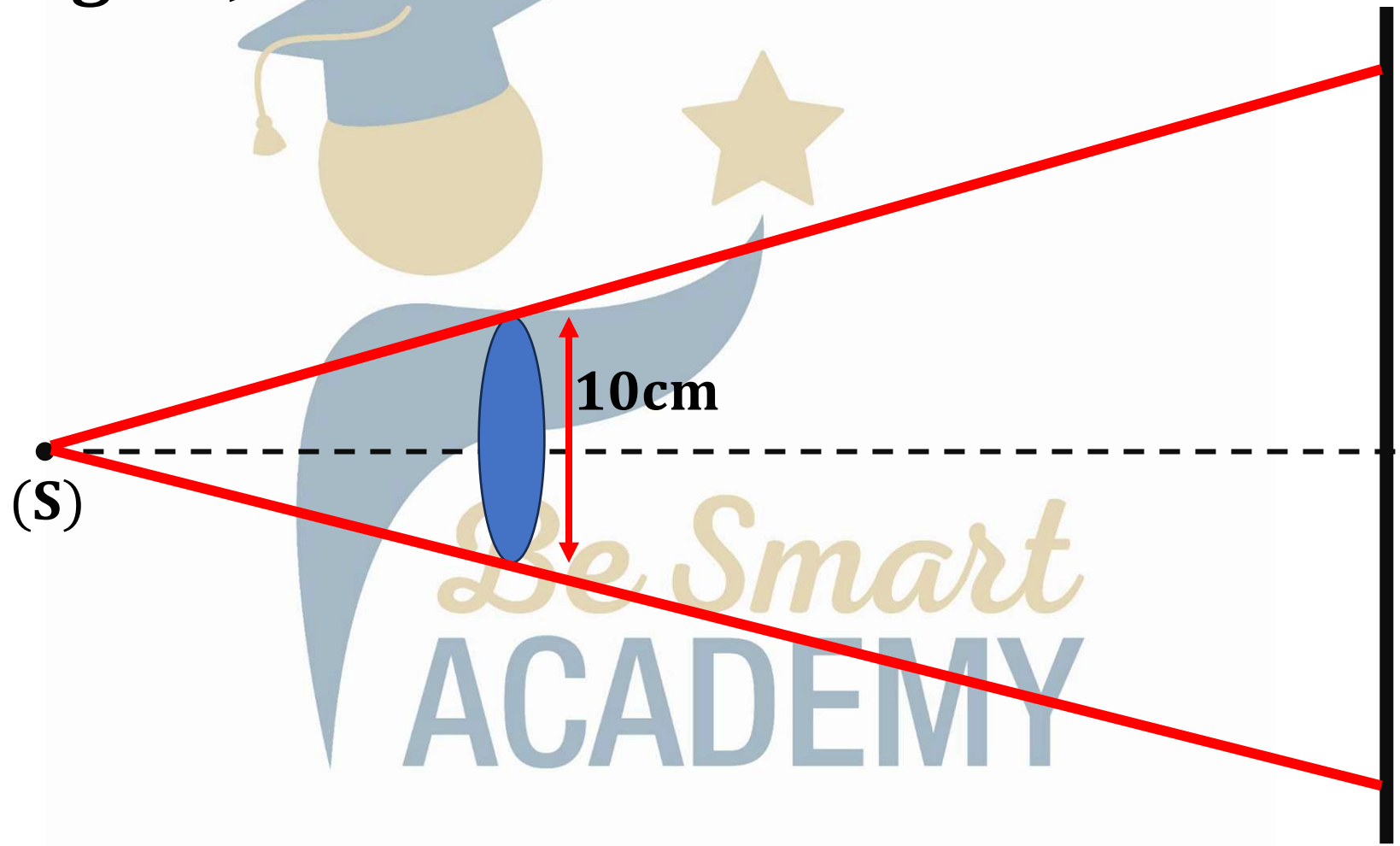
Exercise 1

An opaque disk of radius $R = 10cm$ is placed in a dark room between a point source (S) and a screen.
The plane of the disk is parallel to that of the screen and they are 80cm apart. (S) belongs to the axis of the disk, and it is at a distance of 50 cm from the disk.



Exercise 1

1) Draw a figure, then show on the screen the formed shadow.



Exercise 1

2) Compare the size of the shadow to that of the disk.

The shadow of the disk is larger than the disk it self

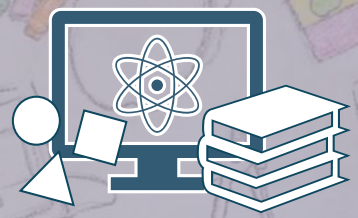
3) Determine, by calculation, the radius of the formed shadow.

$$\frac{distance\ between\ (S) and\ disk}{distance\ between\ (S)\ and\ shadow} = \frac{size\ of\ disk}{size\ of\ shadow}$$

$$\frac{50}{50+80} = \frac{10}{size\ of\ shadow} \Rightarrow size\ of\ shadow = \frac{130 \times 10}{50}$$

$$size\ of\ shadow = 26cm$$

The End

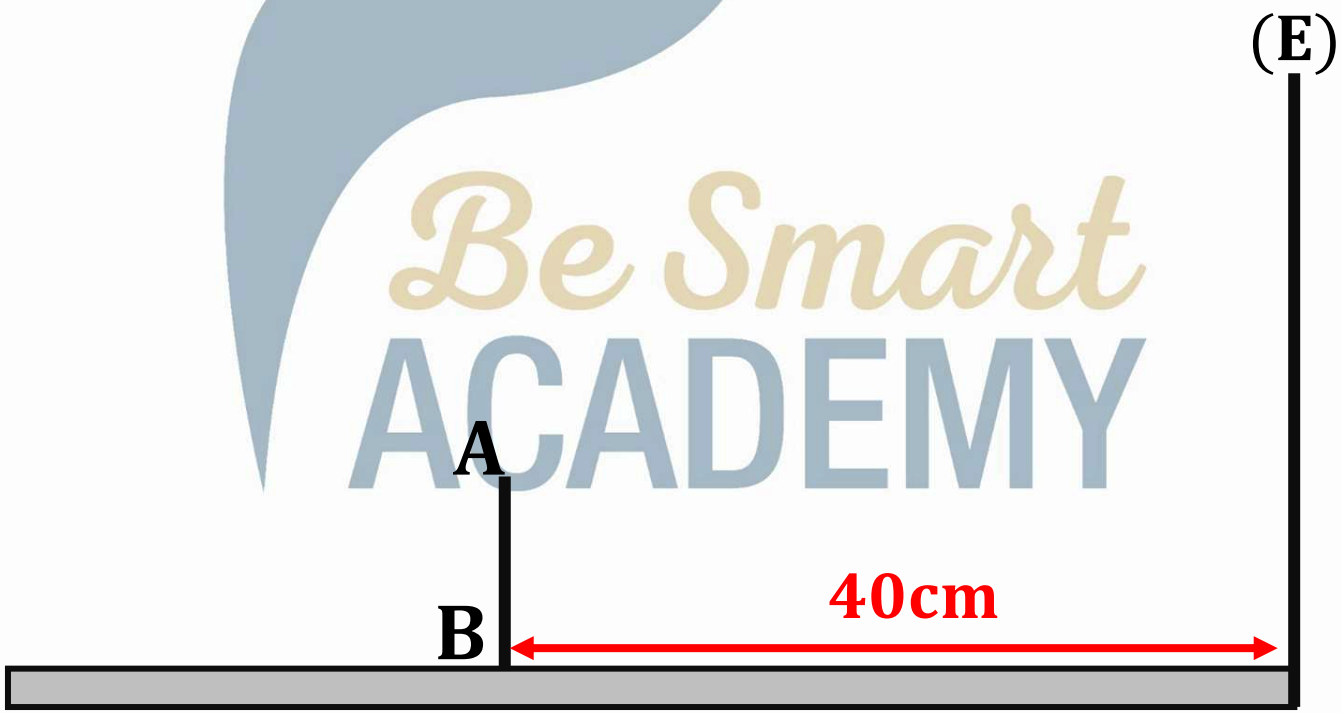


Think then Solve

Exercise 2

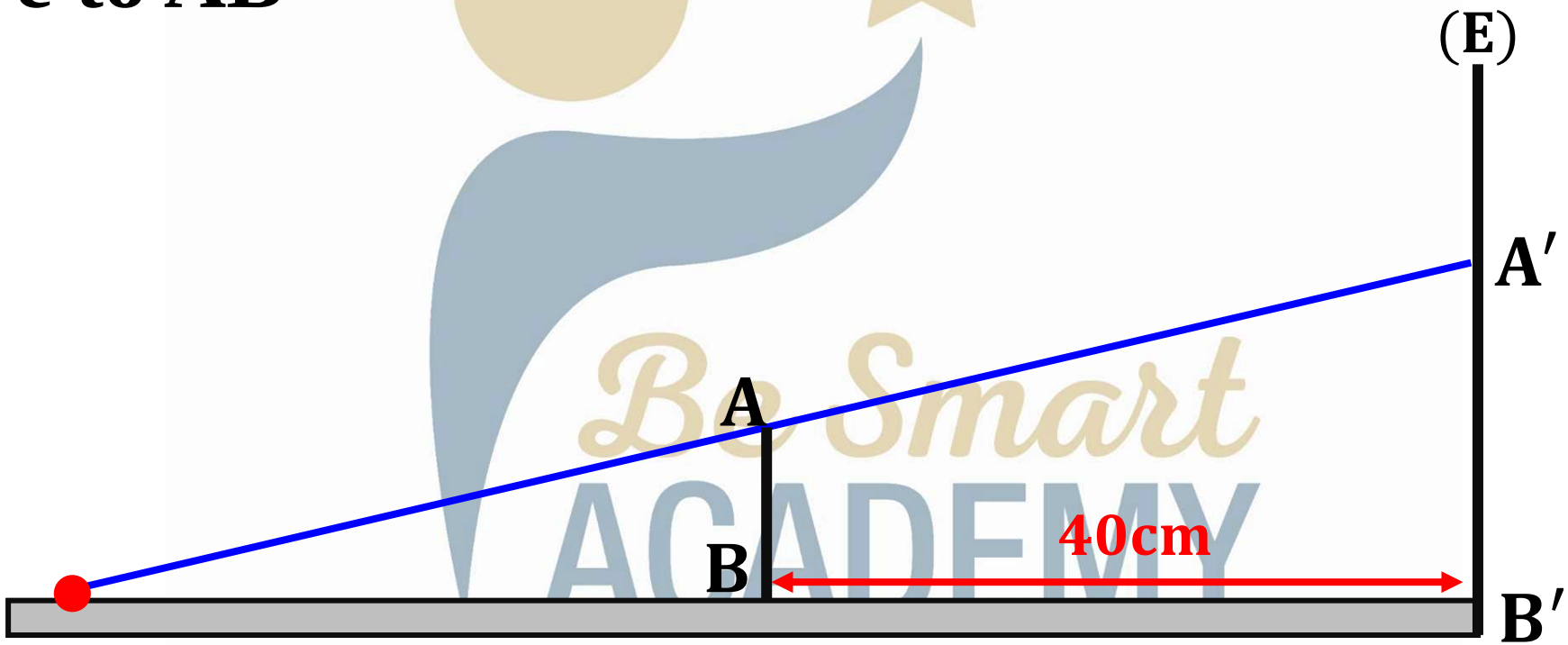
A point source (S) is placed, on the ground in a dark room, in front of an opaque vertical rod AB. B is on the ground and the length of AB is 20 cm.

A vertical screen (E) is placed at a distance of 40 cm behind the rod



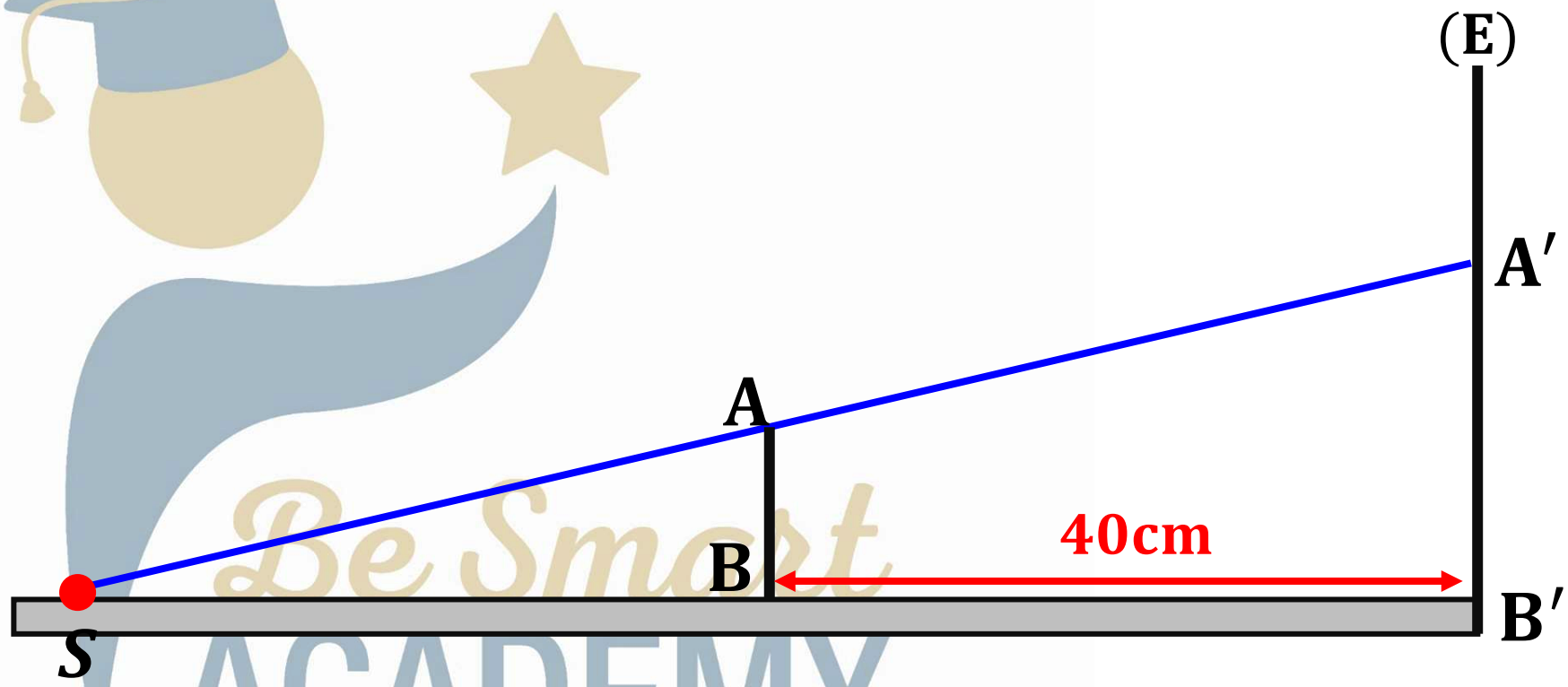
Exercise 2

1) The length of the shadow A'B’ formed on the screen is double that of AB. Determine the position of the source (S) relative to AB



Exercise 2

2) Determine the distance between the point source S and the rod AB.



$$\frac{AB}{A'B'} = \frac{SB}{SB'}$$

$$\frac{20}{40} = \frac{x}{x+40}$$

$$\frac{1}{2} = \frac{x}{x+40} \Rightarrow 2x = x + 40 \Rightarrow x = 40cm$$

The End