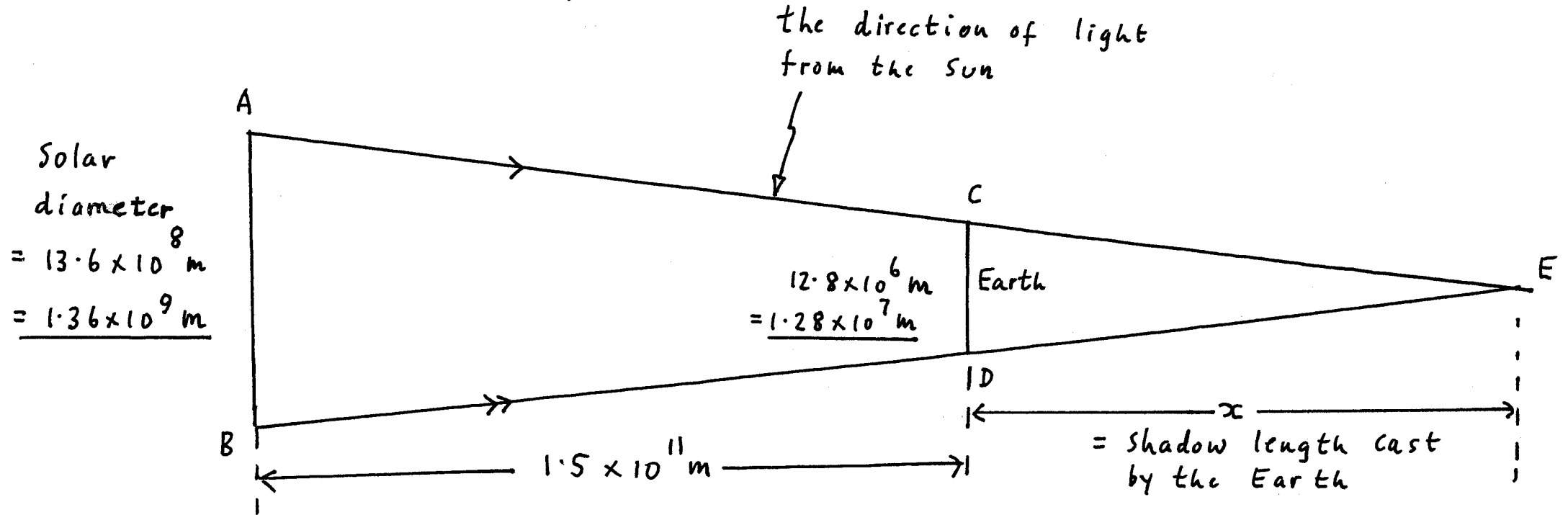


Calculating the length of the shadow cast by the Earth in space

Clearly, the diagram cannot be drawn to scale. However, with the correct Solar and Terrestrial dimensions employed, we can utilise our knowledge of trigonometry to calculate this distance.



Referring to the above diagram:

Triangles ABE and CDE are isosceles.

Also, triangles ABE and CDE are similar.

$$\therefore \frac{1.36 \times 10^9 \text{ m}}{(1.5 \times 10^{11} + x) \text{ m}} = \frac{1.28 \times 10^7 \text{ m}}{x \text{ (m)}}$$

Simplifying:

$$\frac{1.36 \times 10^9}{(1.5 \times 10^{11} + x)} = \frac{1.28 \times 10^7}{x}$$

Proceed, in order to solve for x .

D.F.

2009, June 23