

Periscopes and Telescopes

4. Fig. 4 shows a periscope which uses two plane (flat) mirrors.

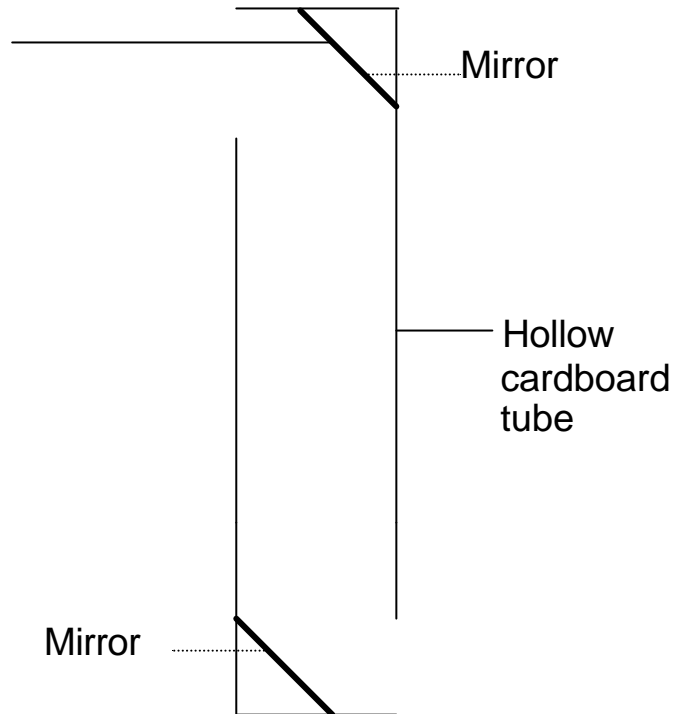


Fig. 4

(i) Complete the ray diagram in Fig. to show how the light reaches Julie's eye. (2)

(b) Explain why this would be useful at a sports game with a large crowd.

(1)

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5. Telescopes are used by scientists to study planets, stars and galaxies. Many telescopes are used on Earth, and a few are used in space.

(a) Fig. 5 shows the Hubble telescope which is in orbit around Earth.

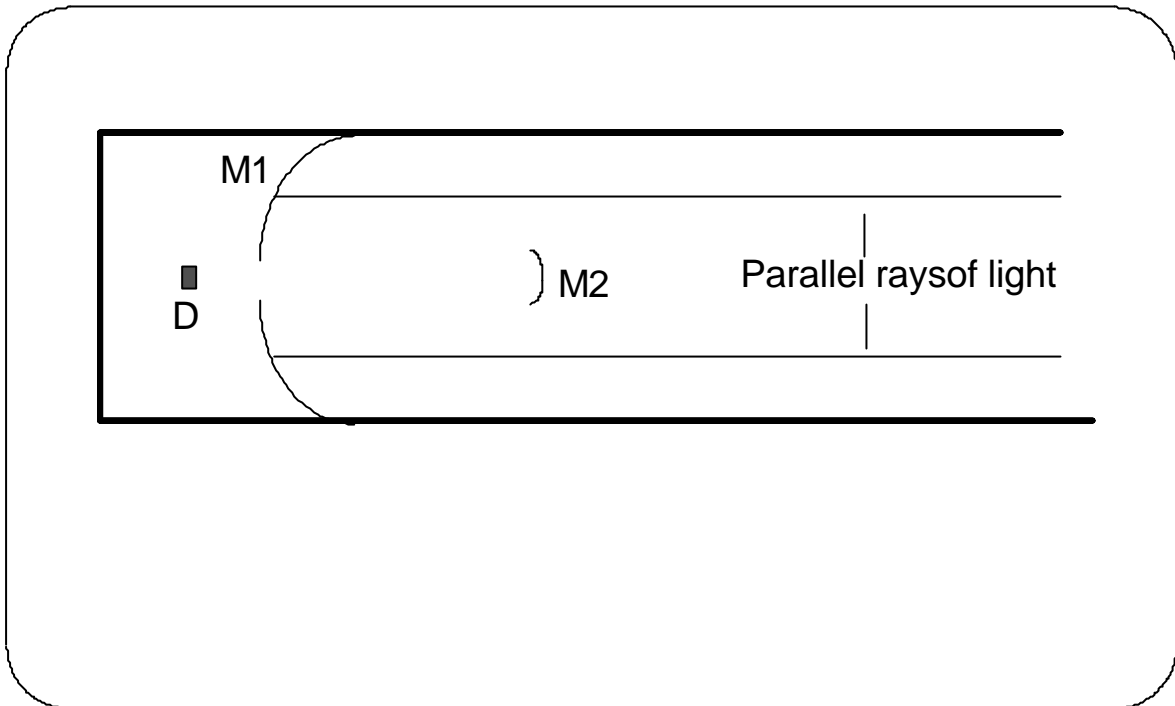


Fig. 5

M1 and M2 are two curved mirrors which focus the light onto the front of the detector D. Mirror M1 has a small hole in the centre.

(i) Complete the ray diagram to show how the rays reach the detector.

(2)

(ii) Before a correction was made to the mirror M1 it had a greater curvature. This gave fuzzy images of stars and galaxies at the detector. Suggest why this happened.

(1)

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- (b) Fig.6 shows another type of telescope used on Earth.
It uses two lenses

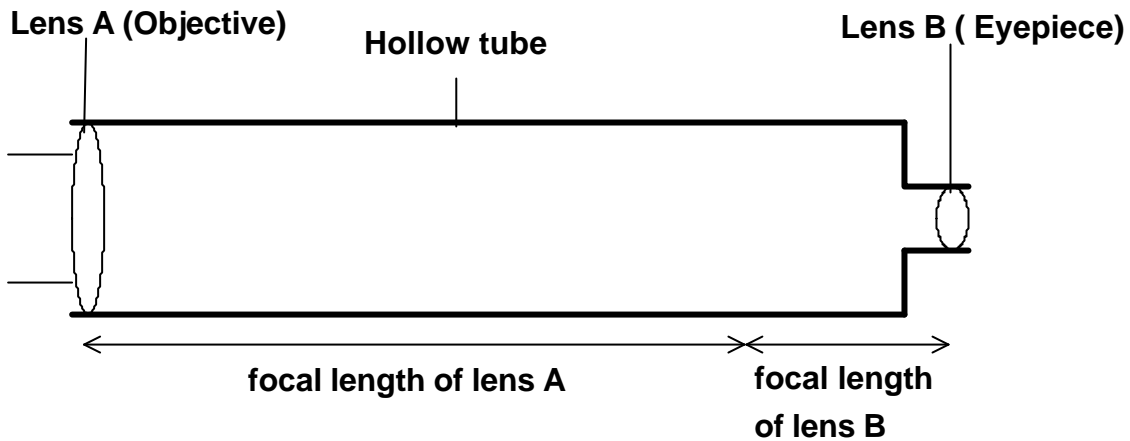


Fig.6

- (i) Complete the ray diagram **on Fig.6** to show how the rays of light travel to the eye.

(2)

- (ii) Explain why a distant object will be seen upside down with this telescope.

(1)

- (iii) Suggest one problem that many scientists have in obtaining good images in telescopes when used in towns and cities.

(1)