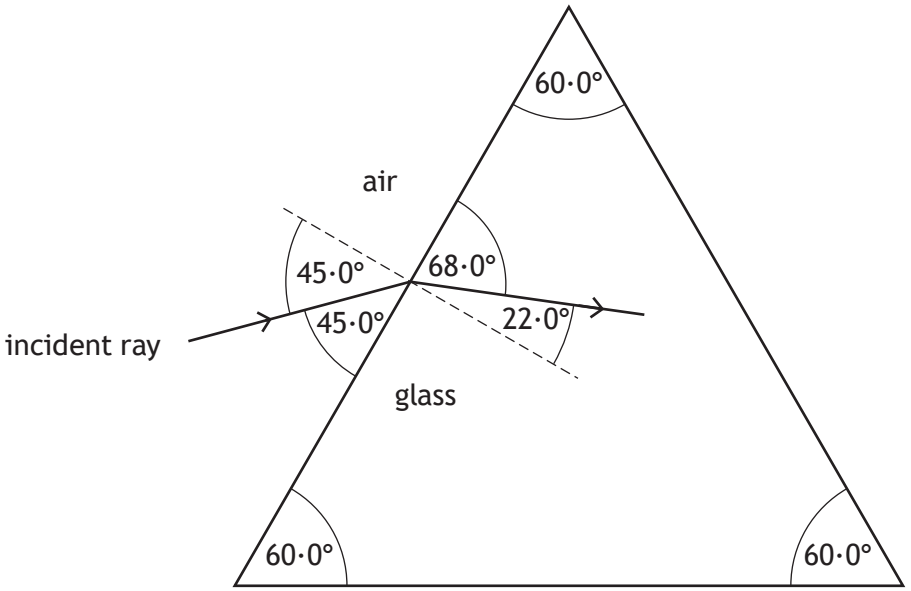
9. A ray of monochromatic light is incident on a glass prism as shown.



(a) Show that the refractive index of the glass for this ray of light is 1·89. **2**

Space for working and answer

(b) (i) State what is meant by the term *critical angle*. **1**

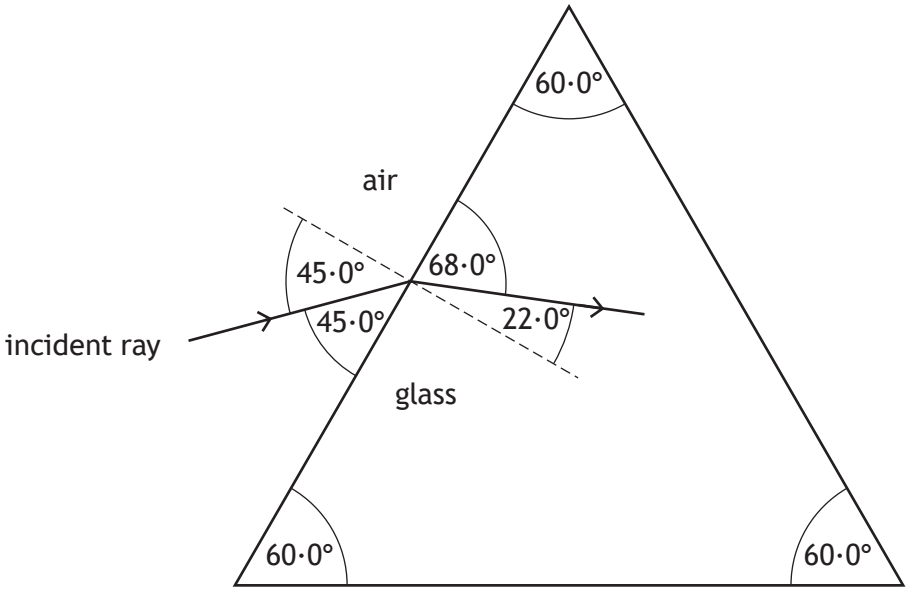
9. (b) (continued)

(ii) Calculate the critical angle for this light in the prism. **3**

Space for working and answer

(iii) Complete the diagram below to show the path of the ray as it passes through the prism and emerges into the air.

Mark on the diagram the values of all relevant angles. **4**

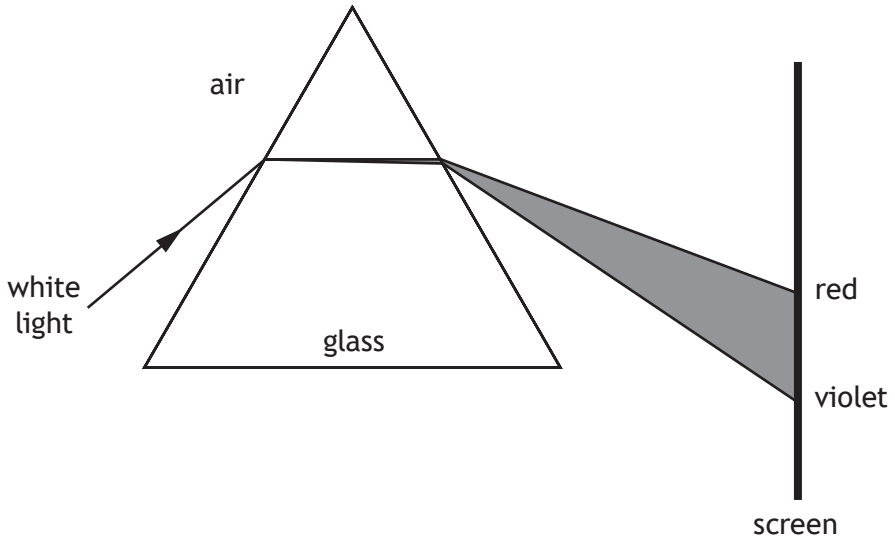


(An additional diagram, if required, can be found on *page 45*.)

[Turn over

9. (continued)

(c) A ray of white light is shone through the prism and a spectrum is observed as shown.



The prism is now replaced with another prism made from a different type of glass with a lower refractive index.

Describe one difference in the spectrum produced by this prism compared to the spectrum produced by the first prism. **1**