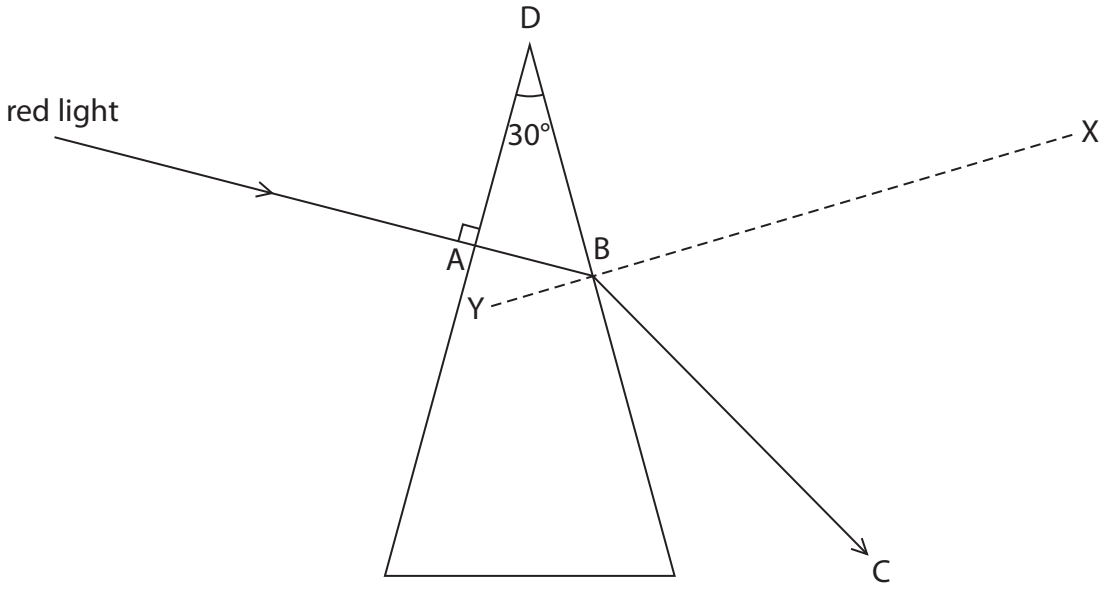
9 A student investigates what happens when light passes through a glass prism.

He shines red light into the prism so that the light is incident at 90° at A.

He then completes the path of the light through the prism as shown.



(a) (i) State the advantage of shining the light at right angles into the prism.

(1)

.....

.....

(ii) Suggest why the student uses light of just one colour.

(1)

.....

.....

.....

(iii) State the name given to the line XY.

(1)

.....

(b) (i) Measure the angle of refraction of the light at B.

(1)

angle = ... degrees

(ii) State the relationship between refractive index, angle of incidence and angle of refraction.

(1)

(iii) The angle of incidence at B is 30°.

Calculate the refractive index of the glass.

(2)

refractive index = ...

(c) The critical angle of the glass prism is 35°.

(i) Explain what is meant by the term **critical angle**.

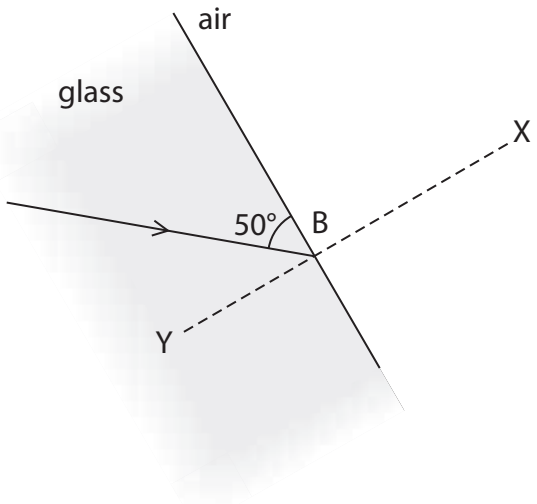
You may draw a diagram to help your answer.

(2)

(ii) The student shines the light so that it hits B at a different angle.

Continue the path of the ray of light on the diagram.

(2)



(Total for Question 9 = 11 marks)