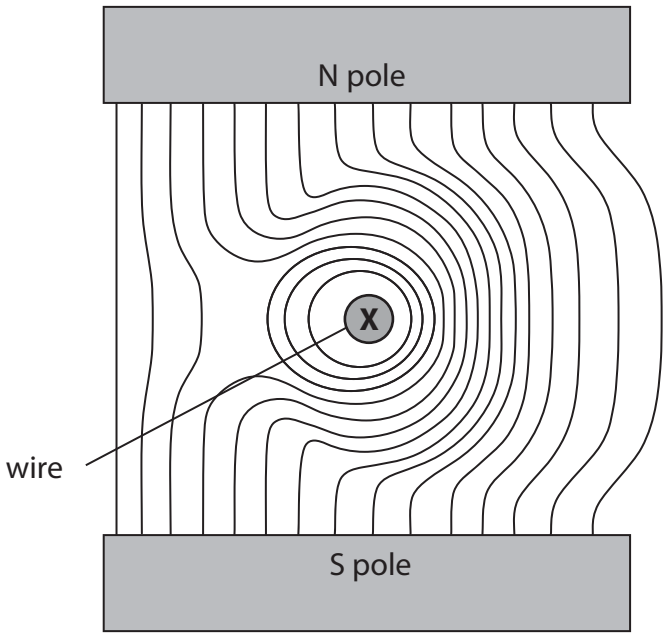
4 Magnetic field lines show the shape and direction of a magnetic field.

(a) The diagram shows a cross-section through a wire placed between two magnetic poles.

The wire carries electric current into the page at **X**.

The shape of the magnetic field is shown.



(i) Add arrows to two of the magnetic field lines to show the direction of the magnetic field.

(1)

(ii) Draw an arrow on the diagram to show the direction of the force on the wire.

Label this arrow **F**.

(2)

(b) The wire is removed and the magnetic field between the poles changes.

Sketch the new magnetic field.

(2)

N pole

S pole

(c) Explain how you could use a plotting compass to investigate the magnetic field around a bar magnet.

You may draw a diagram to help your answer.

(3)

(Total for Question 4 = 8 marks)