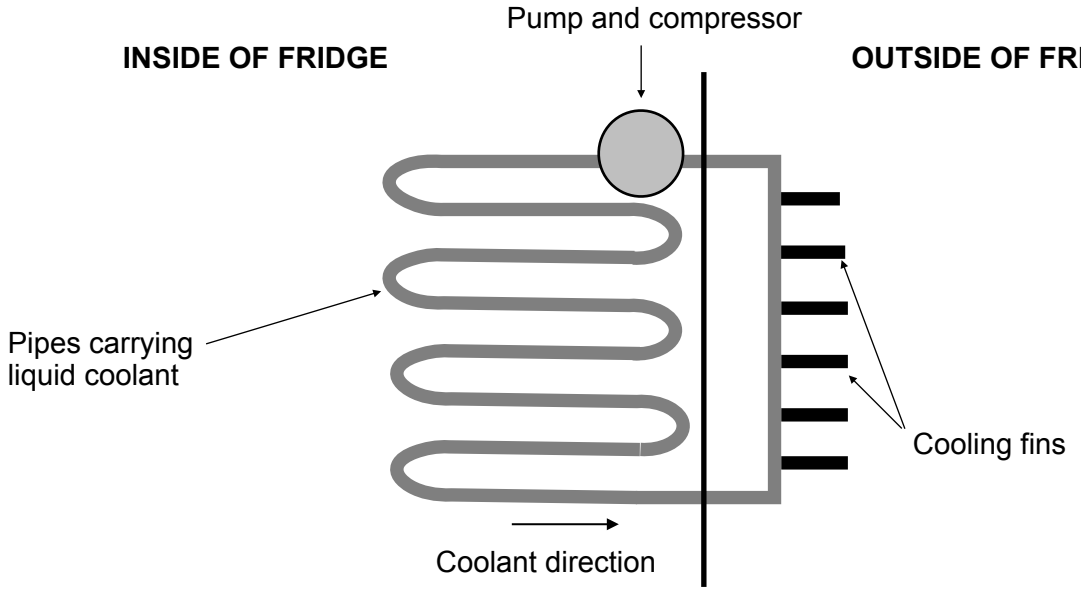
Do not write outside the box

1 The diagram shows the cooling mechanism for a fridge.



The cooling mechanism works in the following way:

- The liquid coolant is circulated throughout the pipes in the fridge.
- It absorbs heat energy from inside the fridge and becomes a gas.
- Cooling fins radiate the heat energy from the gas coolant to the surroundings.
- The gas coolant now condenses back to a liquid and is circulated back into the fridge.

1 (a) (i) Why are the pipes carrying the liquid coolant inside the fridge coloured matt black? **[1 mark]**

……

……

1 (a) (ii) Why are the **cooling fins** painted matt black? **[1 mark]**

……

……

1 (a) (iii) Explain why the liquid coolant becomes a gas when it absorbs heat energy from inside the fridge.

Refer to the particles in the coolant in your answer. **[2 marks]**

……

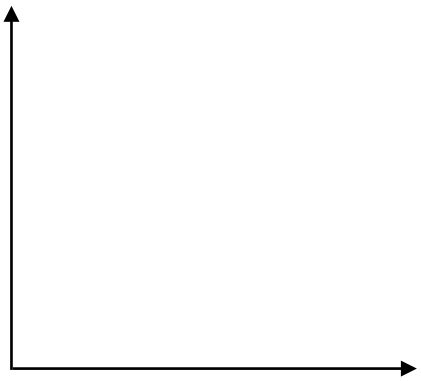
……

……

1 (b) The number of cooling fins on the back of the fridge affects the amount of heat energy released to the surroundings.

This affects the speed at which a new fridge can cool down from 21^{O}C to 3^{O}C.

Complete the sketch graph below to show the relationship between the **number of cooling fins** and the **time taken to cool** from room 21^{O}C**.** **[3 marks]**



(Total 7 marks)

End