

1 The table shows heat loss through a poorly insulated house.

| Part of house | Energy loss, joules per second |
|--------------------------|--------------------------------|
| Roof | 150 |
| Floor | 71 |
| Gaps (e.g. below a door) | 70 |
| Windows | 109 |
| Walls | 200 |
| Total | 600 |

1 (a) (i) The house costs £800 per year to heat.

How much money is wasted per year because of the amount of heat that is lost through the roof? **[2 marks]**

$$800 / 4 = \text{(or } 150 / 600 \times 800 = \text{)} [1]$$

Remember you get full marks for a correct answer, but always show working. You divided by 4 because one quarter of the energy is lost from the roof. This is calculated from the table, 150 / 600.

$$\text{Cost} = \text{£ } 200 [2]$$

1 (a) (ii) The homeowner installs loft insulation. This saves her 25% on her **annual** energy bill. The payback time is 2 years.

How much did it cost to install the loft insulation? **[2 marks]**

$$200 \times 2 = \text{(or } 800 / 4 \times 2 = \text{)} [1]$$

She saves £200 per year and it takes two years to pay back the cost.

$$\text{Cost} = \text{£ } 400 [2]$$

1 (a) (iii) Properly insulating a house can help reduce the amount of carbon dioxide in the atmosphere.

Explain why. **[2 marks]**

Less energy lost or wasted. [1]

Less electricity used or less electricity needed/generated from power stations. [1]

Less burning of fossil fuels or coal, oil, gas. [1]

(Total 6 marks)

End