



GCSE Physics A (Gateway)
J249/04 Physics A P5-P8 and P9 (Higher Tier)

Question Set 20

20

A student has two radiators in her home. They are filled with different liquids and have different power ratings.

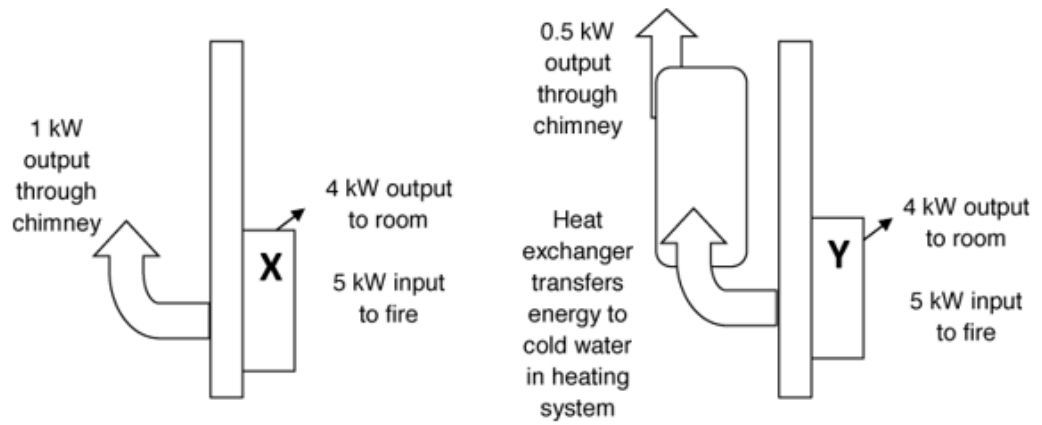
The diagram shows information about the two heaters.

Oil radiator	Water radiator
 <p>Heater contains 10 kg of oil</p>	 <p>Heater contains 10 kg of water</p>
<p>400 W heater</p> <p>Specific heat capacity for oil = 1 680 J/kg°C</p>	<p>1000 W heater</p> <p>Specific heat capacity for water = 4 200 J/kg°C</p>

- (a) The radiators are turned on and both radiators increase in temperature by 40 °C in 1 680 seconds.

Show, by calculation, that the heaters take the same time to heat up.

(b) The student has two fires in her home (X and Y) shown in the diagrams below.



Why does fire Y help to save money on the energy bills for her home?

Use calculations of efficiency in your answer.

[4]

Total Marks for Question Set 20: 8

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