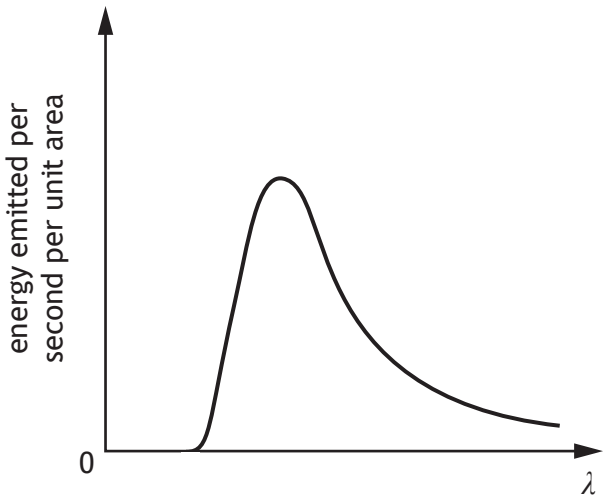
6. Stars emit radiation with a range of wavelengths. The peak wavelength of the radiation depends on the surface temperature of the star.

(a) The graph shows how the energy emitted per second per unit area varies with the wavelength λ of the radiation for a star with a surface temperature of 5000 K.



A second star has a surface temperature of 6000 K.

On the graph above, add a line to show how the energy emitted per second per unit area varies with the wavelength λ of the radiation for the second star. **2**

(An additional graph, if required, can be found on *page 44*)

6. (continued)

(b) The table gives the surface temperature T, in kelvin, of four different stars and the peak wavelength λ_{peak} of radiation emitted from each star.

T (K)	λ_{peak} (m)
7700	$3{\cdot}76 \times 10^{-7}$
8500	$3{\cdot}42 \times 10^{-7}$
9600	$3{\cdot}01 \times 10^{-7}$
12 000	$2{\cdot}42 \times 10^{-7}$

Use **all** the data in the table to show that the relationship between the surface temperature T of a star and the peak wavelength λ_{peak} radiated from the star is **3**

$$T = \frac{2{\cdot}9 \times 10^{-3}}{\lambda_{peak}}$$

Space for working and answer

[Turn over