9 **(a)** State Wien's displacement law.

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..... [2]

(b) Fig. 9.1 shows the variation with d^{-2} of the radiant flux intensity F observed from a star X, where d is the distance of the observer from the star. Fig. 9.2 shows the variation with wavelength λ of the rates of emission P of radiation by star X and the Sun.

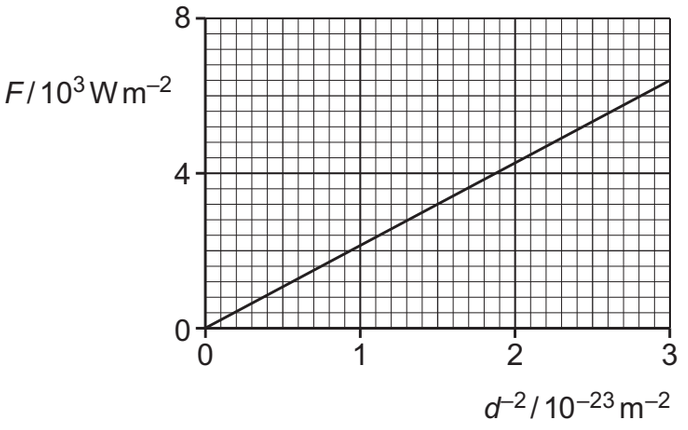

Fig. 9.1

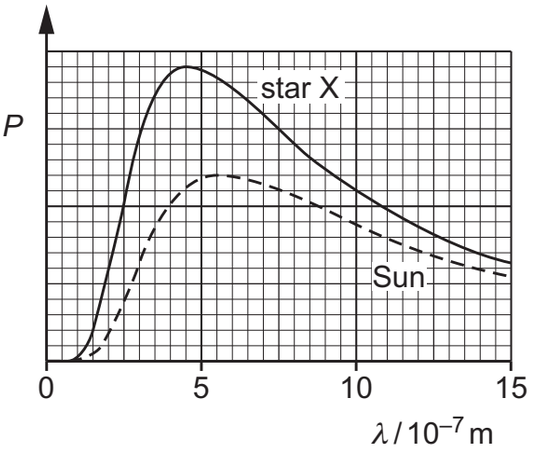

Fig. 9.2

The surface temperature of the Sun is 5770 K.

State **three** conclusions about star X that can be drawn from this data. The conclusions may be qualitative or quantitative. Use the space for any working.

1 .....

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2 .....

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3 .....

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[3]

(c) Star X is in a galaxy that is moving away from the Earth.

Suggest, with a reason, how the line for star X in Fig. 9.2 would appear differently if it had been obtained from data measured on the Earth.

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[Total: 7]