11   The intensity of the sun's radiation, y watts per square metre, and the average distance from the sun, x astronomical units, are shown in Fig. 11 for the planets Mercury and Jupiter.

	x	y
Mercury	0.3075	14400
Jupiter	4.950	55.8

Fig. 11

The intensity y is proportional to a power of the distance x.

(i)   Write down an equation for y in terms of x and two constants. [1]

(ii) Show that the equation can be written in the form $\ln y = a + b \ln x$. [2]

(iii) In the Printed Answer Booklet, complete the table for $\ln x$ and $\ln y$ correct to 4 significant figures. [2]

(iv) Use the values from part (iii) to find a and b. [3]

(v)   Hence rewrite your equation from part (i) for y in terms of x, using suitable numerical values for the constants. [2]

(vi) Sketch a graph of the equation found in part (v). [2]

(vii) Earth is 1 astronomical unit from the sun. Find the intensity of the sun's radiation for Earth. [1]