13. The resting metabolic rate, R ml of oxygen consumed per hour, of a particular species of mammal is modelled by the formula,

$$R = aM^b$$

where

- M grams is the mass of the mammal
- a and b are constants

(a) Show that this relationship can be written in the form

$$\log_{10} R = b \log_{10} M + \log_{10} a$$

(2)

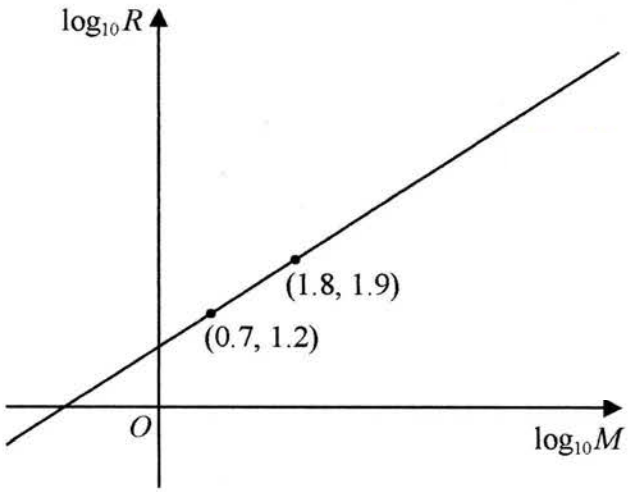

Figure 3

A student gathers data for R and M and plots a graph of $\log_{10} R$ against $\log_{10} M$

The graph is a straight line passing through points (0.7, 1.2) and (1.8, 1.9) as shown in Figure 3.

(b) Using this information, find a complete equation for the model.
Write your answer in the form

$$R = aM^b$$

giving the value of each of a and b to 3 significant figures.

(3)

(c) With reference to the model, interpret the value of the constant a

(1)