**9** A small country started using solar panels to produce electrical energy in the year 2000. Electricity production is measured in megawatt hours (MWh).

For the period from 2000 to 2009, the annual electrical energy produced using solar panels can be modelled by the equation $P = 0.3e^{0.5t}$, where P is the annual amount of electricity produced in MWh and t is the time in years after the year 2000.

(a) According to this model, find the amount of electricity produced using solar panels in each of the following years.

    (i) 2000   **[1]**

    (ii) 2009   **[1]**

(b) Give a reason why the model is unlikely to be suitable for predicting the annual amount of electricity produced using solar panels in the year 2025.   **[1]**

An alternative model is suggested; the curve representing this model is shown in **Fig. 9**.

Fig. 9
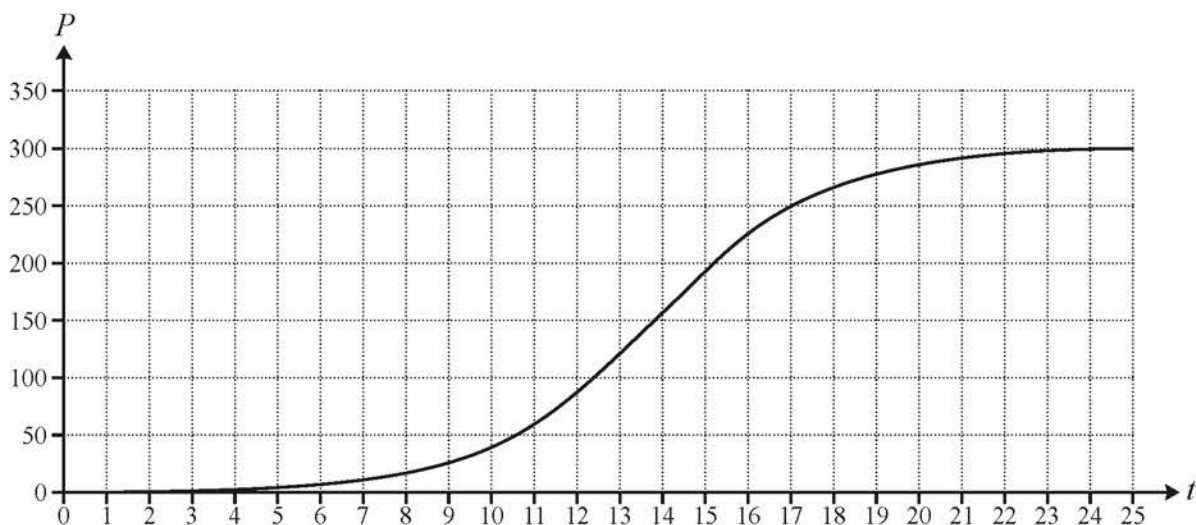
(c) Explain how the graph shows that the alternative model gives a value for the amount of electricity produced in 2009 that is consistent with the original model.   **[1]**

(d) (i) On the axes given in the Printed Answer Booklet, sketch the gradient function of the model shown in **Fig. 9**.   **[2]**

    (ii) State approximately the value of t at the point of inflection in **Fig. 9**.   **[1]**

    (iii) Interpret the significance of the point of inflection in the context of the model.   **[1]**

(e) State approximately the long term value of the annual amount of electricity produced using solar panels according to the model represented in **Fig. 9**.   **[1]**