9. **In this question you must show all stages of your working.**
Solutions relying entirely on calculator technology are not acceptable.

A new type of car is released for sale.

The total number of this type of car sold, N, in a particular region, t months after the cars were released for sale, is modelled by the equation

$$N = 5000 - 5000e^{-0.075t} \qquad t \geqslant 0$$

Use the equation of the model to answer parts (a), (b), (c) and (d).

(a) Find the total number of cars sold in the first 3 months.

(2)

Given that $N = 3000$ when $t = T$

(b) find the value of T giving the answer to 2 decimal places.

(3)

(c) Find the rate of increase in the total number of cars sold when $t = 3$, giving the answer to 3 significant figures.

(2)

After a marketing campaign, the total number of cars sold is expected to rise and have an upper limit of 6500

(d) Using this information, suggest **one** refinement to the model.

(1)