7 **(a)** Express $\frac{1}{x}+\frac{1}{A-x}$ as a single fraction. **[1]**

The population of fish in a lake is modelled by the differential equation

$$\frac{dx}{dt}=\frac{x(400-x)}{400}$$

where x is the number of fish and t is the time in years.

When $t = 0$, $x = 100$.

(b) In this question you must show detailed reasoning.

Find the number of fish in the lake when $t = 10$, as predicted by the model. **[8]**