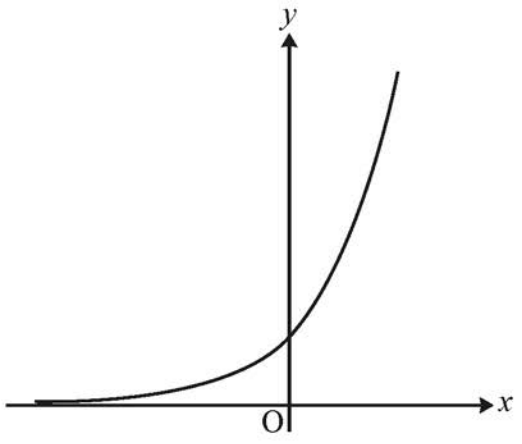
5 **(a)** The diagram shows the curve $y = e^x$.



On the axes in the Printed Answer Booklet, sketch graphs of

(i) $\frac{dy}{dx}$ against x, **[1]**

(ii) $\frac{dy}{dx}$ against y. **[2]**

(b) Wolves were introduced to Yellowstone National Park in 1995.

The population of wolves, y, is modelled by the equation

$y = Ae^{kt}$,

where A and k are constants and t is the number of years after 1995.

(i) Give a reason why this model might be suitable for the population of wolves. **[1]**

(ii) When $t = 0$, $y = 21$ and when $t = 1$, $y = 51$.

Find values of A and k consistent with the data. **[3]**

(iii) Give a reason why the model will not be a good predictor of wolf populations many years after 1995. **[1]**