**3.** The curve $C$ has equation

$$x = \frac{2y - 1}{(y - 1)^2} \qquad x > 0 \quad y > 1$$

(a) Find $\frac{dx}{dy}$ in terms of $y$, giving the answer in simplest form.

**(3)**

The point $P$ lies on $C$.

Given that $P$ has $y$ coordinate 2

(b) find the equation of the tangent to $C$ at $P$, giving the answer in the form $ax + by + c = 0$, where $a$, $b$ and $c$ are integers.

**(3)**

**(Total for Question 3 is 6 marks)**

**4.**

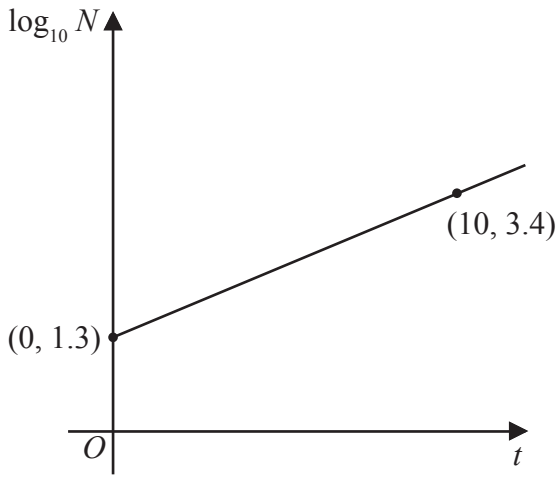



**Figure 2**

The total number of deliveries made by a company is being monitored.

The total number of deliveries, $N$ thousands, made by the company, $t$ years after monitoring began, is modelled by the equation

$$N = pq^t$$

where $p$ and $q$ are constants.

Figure 2 shows the linear relationship between $\log_{10} N$ and $t$

(a) Find, to 4 significant figures, the value of $p$ and the value of $q$.

**(4)**

When $t = T$, $N = 700$

(b) Find, according to the model, the value of $T$ to 3 significant figures.

*(Solutions relying entirely on calculator technology are not acceptable.)*

**(2)**

**(Total for Question 4 is 6 marks)**