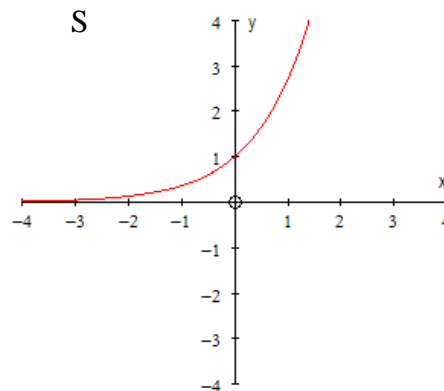
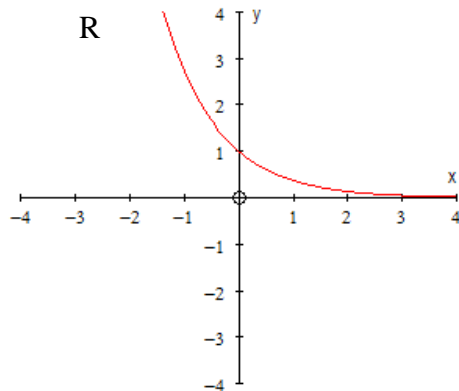
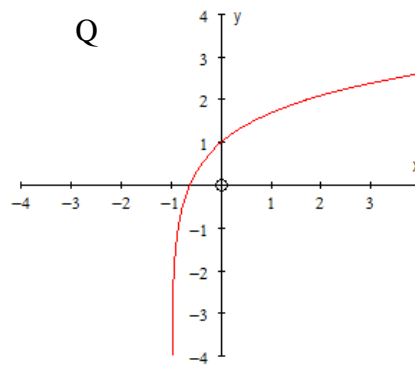
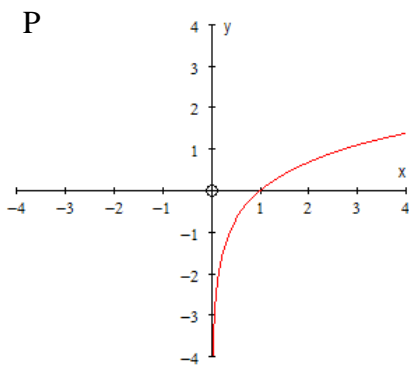


Section 2: Natural logarithms and exponentials

Section test

- Solve the equation $e^{2-x} = 0.5$.
- Solve the equation $\ln(1 - 2x) = 0.4$.
- Solve the equation $2e^x + 3e^{-x} = 7$
- Solve the equation $2\ln x + 1 = \ln(2x)$.
- Four graphs P, Q, R and S are shown below.



Which one is the graph of $y = e^x$?
Which one is the graph of $y = \ln x$?

- The temperature T of a hot cup of tea at time t is given by the formula

$$T = 20 + 70e^{-t}$$

This formula can be rearranged to give t in terms of T as follows:

(a) $t = \ln\left(\frac{T-20}{70}\right)$

(b) $t = \ln\left(\frac{70}{T-20}\right)$

(c) $t = \frac{20 - \ln T}{70}$

(d) $t = \frac{\ln T - 20}{70}$

Edexcel AS Maths Exponentials & logs 2 section test

7. The speed, $v \text{ ms}^{-1}$ of a parachutist after t seconds is given by

$$v = 10 + 20e^{-0.01t}$$

Find the speed of the object after 20 seconds.

Find the time at which the speed of the parachutist is 15 ms^{-1} .

8. The number N of insects in a colony after t days is modelled by $N = 20e^{0.2t}$.

Find the number of insects (to the nearest whole number) after 10 days.

After how many complete days does the number of insects first exceed 50000?