

Exponential Graphs Questions

Exercise 3H

- ① Sketch the graphs of $y = 2^x$ and $y = 3^x$ on the same axes.
- ② Sketch the graphs of $y = 3^x$ and $y = 3^{-x}$ on the same axes.
- ③ Sketch the graphs of $y = 2^x$, $y = 2^x - 1$ and $y = 2^x + 1$ on the same axes.
- ④ Sketch the graphs of $y = 3^{-x}$, $y = 3^{-x} - 1$ and $y = 3^{-x} + 1$ on the same axes.

RWC

- ⑤ A virus is spreading among the inhabitants of a remote island and it will be 5 days before an antidote can be shipped there. Initially there are 100 inhabitants on the island. The number of people surviving after t hours is given by $N = 100 \times 10^{-\frac{t}{1000}}$.

- (i) Calculate how many people are surviving after 24 hours.
- (ii) Calculate how many people are surviving at the beginning of the fifth day when the vaccine is delivered.

Once the vaccine has been administered, it is a further 24 hours before it begins to be effective.

- (iii) How many more people die before the vaccine begins to take effect?

- ⑥ Use any graphing software at your disposal to draw the graphs of $y = 2 \times 3^x$, $y = 3 \times 2^x$ and $y = 6^x$ on the same axes and write down what you notice.

- ⑦ (i) Use any graphing software at your disposal to draw the graphs of $y = 2 \times 4^x$, $y = 4 \times 2^x$ and $y = 8^x$ on the same axes.

- (ii) In what ways is the result the same as in the previous question and in what ways is it different?

- ⑧ Use any graphing software at your disposal to draw the graphs of $y = 2^x + 2^{-x}$ and $y = 3^x + 3^{-x}$ on the same axes and write down what you notice.