Logarithms and Exponentials 1
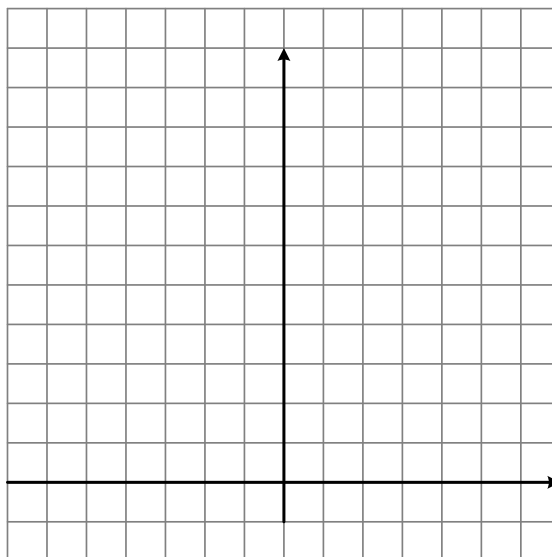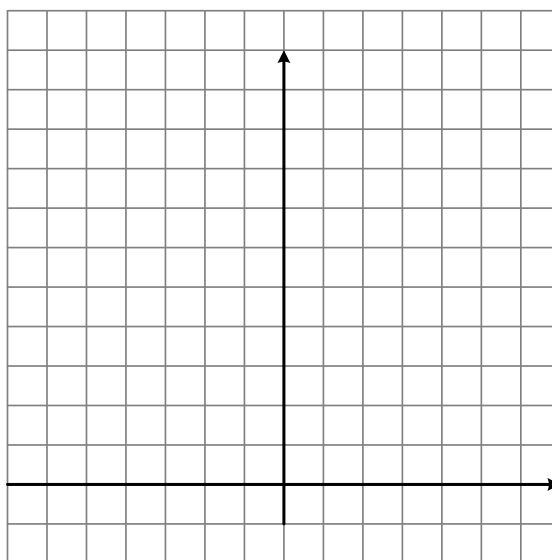
1   Watch the video on www.achildsguideto.com → Logs and Exponents → Logarithms Video 1.

2   Complete the following exercises.
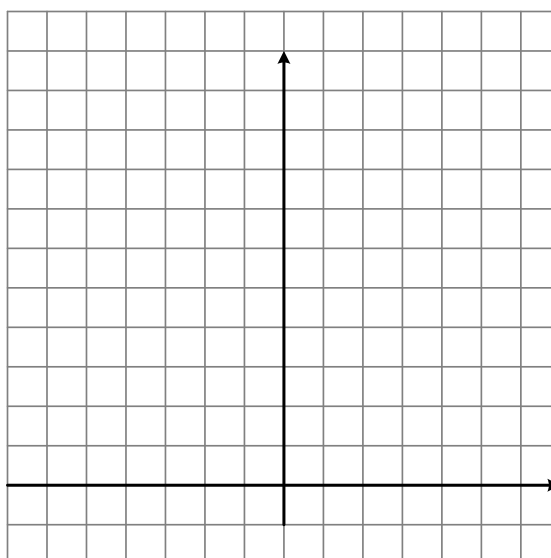

1   Sketch a graph of $y = a^x$ where a>1.

2   Sketch a graph of $y = a^x$ where $0 < a < 1$.

3   Fill in the table below to find the values of $y = 2^x$
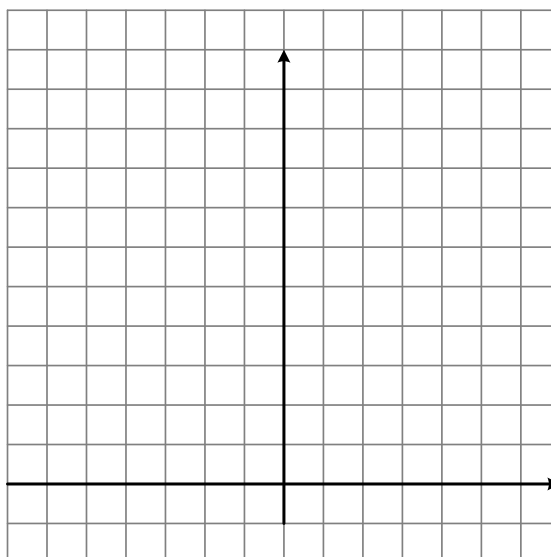
x	-3	-2	-1	0	1	2	3	4
y	$\frac{1}{8}$				2			

4   Draw a graph of $y = 2^x$.

5   Using the table below, sketch a graph of $y = 3^x$.

x	-3	-2	-1	0	1	2	3
y							

6   Compare the graphs of $y = 2^x$ and $y = 3^x$. Write a couple of sentences explaining what you notice.

You will find that the y scale needs to be much larger very quickly as the numbers are increasing exponentially. For this reason, we often use graph paper that has a logarithmic scale for y values which would alter the shape of the graph.
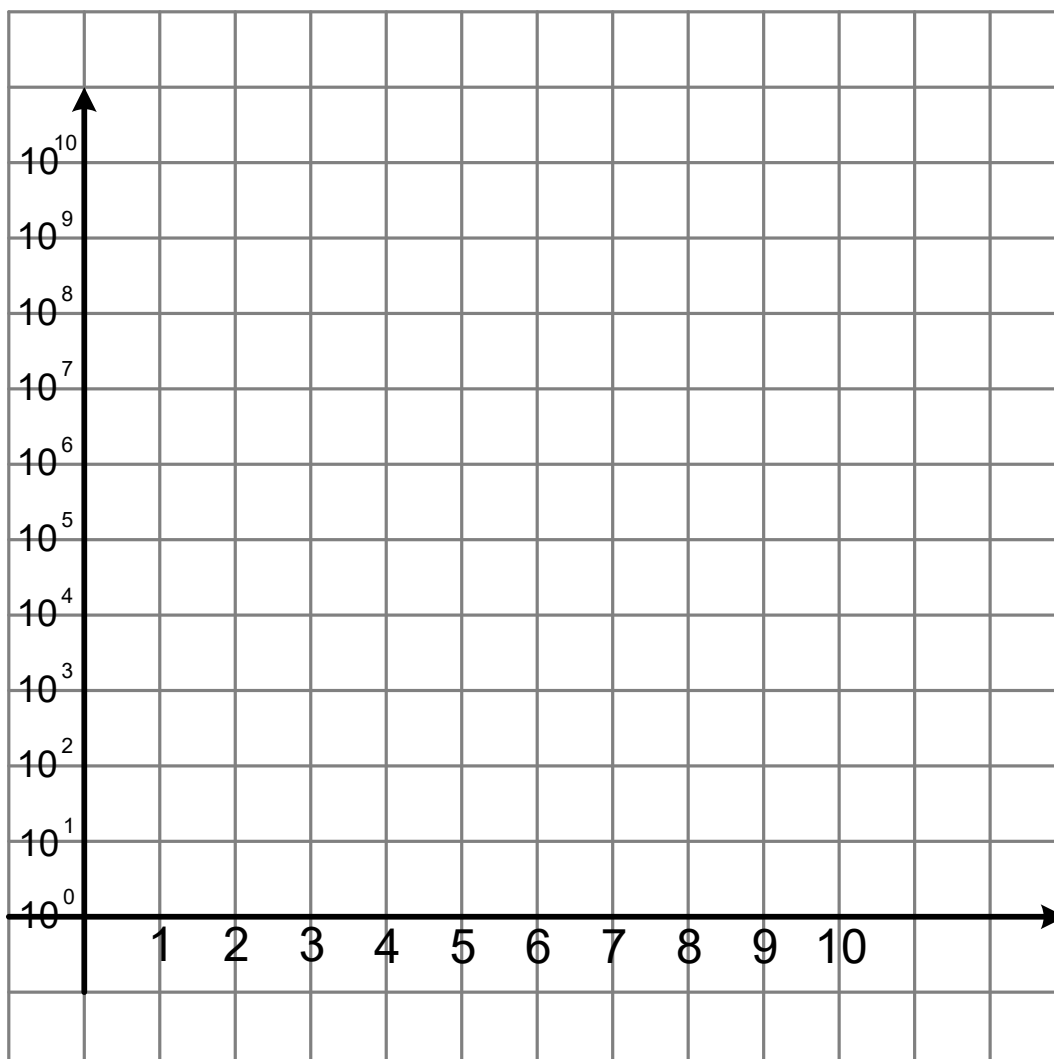
7   On the graph above, plot $y = 10^x$. What do you notice about the shape of the line?

This is a graph with a logarithmic scale. The shape of the graph allows mathematicians to find patterns in data when it is not initially clear. If the y axis was labelled $\log_{10} x$ instead of y, we could just label the y axis with 0, 1, 2, 3, 4… etc.