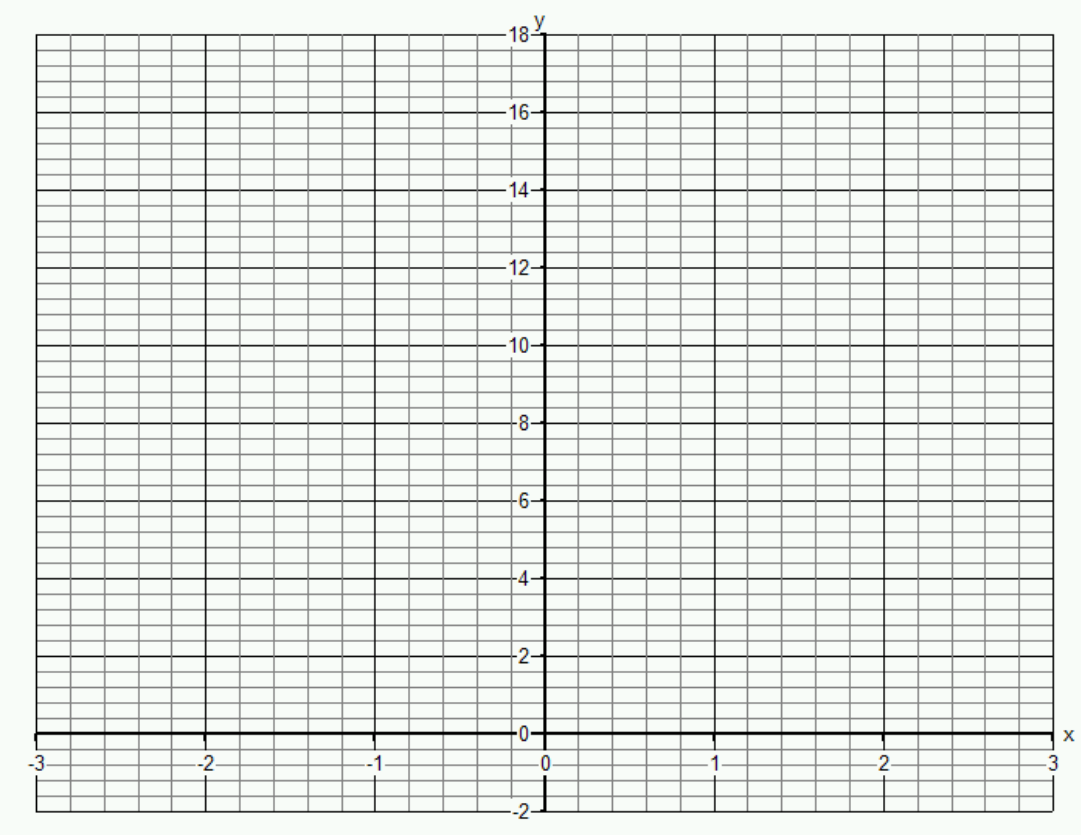
The Function $y = a^x$

Complete the table below for each of the functions and then plot all the graphs on the grid below. Remember to label each of your graphs as you plot them.

x	-3	-2	-1	0	1	2	3
$y = 3^x$							
$y = 2^x$							
$y = 1.5^x$							
$y = 0^x$							
$y = \left(\frac{1}{2}\right)^x$							
$y = \left(\frac{1}{3}\right)^x$							
$y = \left(\frac{2}{3}\right)^x$							



Logarithms

Exploring the Log button

Use your calculator to complete this table:

10^0 =		Log 0 =	
10^1 =		Log 10 =	
10^2 =		Log 100 =	
10^3 =		Log 1000 =	
10^4 =		Log 10000 =	

What do you think the “log” button on your calculator does?

What are logarithms?

In other words….

Solving Exponential Equations using Logs

Find x when

$10^x = 600$

$10^x = 400$

$10^x = 150$

Rewrite these equations as logs:

$10^3 = 1000$

$5^4 = 625$

$2^{10} = 1024$

Important Results to Learn

Evaluating Logs

Find the value of:

1) $\text{Log}_3 81$

2) $\text{Log}_4 0.25$

3) $\text{Log}_{0.5} 4$

4) $\text{Log}_a(a^5)$

Now do Exercise 3B and 3C in text book, p40 – 41.

Y12 Homework Introduction to Logarithms

Convert each of the following facts to logarithmic form:

1) $10^3 = 100$
2) $2^4 = 16$
3) $10^4 = 10000$
4) $3^2 = 9$
5) $4^2 = 16$
6) $x^y = 2$

Convert each of the following facts to index form:

1) $\log_{10}100000 = 5$
2) $\log_4 64 = 3$
3) $\log_2 4 = 2$
4) $\log_2 32 = 5$
5) $\log_3 27 = 3$
6) $\log_x y = z$

Evaluate the following logarithmic expressions:

1) $\log_9 3$
2) $\log_2 2$
3) $\log_5 1$
4) $\log_8 64$
5) $\log_{121} 11$
6) $\log_b b^3$

Y12 Homework Introduction to Logarithms

Convert each of the following facts to logarithmic form:

7) $10^3 = 100$
8) $2^4 = 16$
9) $10^4 = 10000$
10) $3^2 = 9$
11) $4^2 = 16$
12) $x^y = 2$

Convert each of the following facts to index form:

7) $\log_{10}100000 = 5$
8) $\log_4 64 = 3$
9) $\log_2 4 = 2$
10) $\log_2 32 = 5$
11) $\log_3 27 = 3$
12) $\log_x y = z$

Evaluate the following logarithmic expressions:

7) $\log_9 3$
8) $\log_2 2$
9) $\log_5 1$
10) $\log_8 64$
11) $\log_{121} 11$
12) $\log_b b^3$