INDICES

1) a) What is $2^4 \times 2^5$ as a power of 2?
   b) Show this is true by writing $2^4 \times 2^5$ in full.
   c) What is a general expression for $2^m \times 2^n$?

2) a) What is $2^7 \div 2^3$ as a power of 2?
   b) Show why this is true by writing $2^7 \div 2^3$ in full.
   c) What is a general expression for $2^m \div 2^n$?

3) a) Find $(2^4)^3$ by writing it as $2^4 \times 2^4 \times 2^4$.
   b) What is a general expression for $(2^m)^n$?

4) Use your answer to 2 c) with m = 1 and n = 1 to find the value of 2^0.

5) Use your answer to 2 c) with m = 0 and n = 1 to find the value of 2^{-1}.

6) a) Complete the table:

x	-4	-3	-2	-1	0	1	2	3	4
2^x						2	4	8	16

   b) What does this suggest as a general expression for 2^{-n}?

7) a) Use your answer to 3 b) to find $(2^{½})^2$.
   b) What does this suggest as a value for $2^{½}$?

8) a) Use your answer to 3 b) to find $(2^{1/3})^3$.
   b) What does this suggest as a value for $2^{1/3}$?
   c) What is the general expression for $2^{1/n}$?
   d) Use your results so far to find a general expression for $2^{p/q}$.

9) Which of the following are true for all values of a, b and n?
   a) $(a + b)^n = a^n + b^n$
   b) $(a - b)^n = a^n - b^n$
   c) $(ab)^n = a^n b^n$
   d) $(a/b)^n = a^n/b^n$