1. Find the value of $x$ in each of the following:
   a) $2^x = 4$  
   b) $2^x = 16$
   c) $4^x = 64$  
   d) $10^x = 1000$
   e) $5^x = 625$  
   f) $3^x = 1$

2. Find the value of $z$ in each of the following:
   a) $2^{(z - 1)} = 8$  
   b) $3^{(z + 2)} = 27$
   c) $4^{2z} = 64$  
   d) $10^{(z + 1)} = 1$
   e) $3^z = 9^{(z - 1)}$  
   f) $5^z = 125^z$

3. Find the value of $n$ in each of the following:
   a) $(\frac{1}{2})^n = 8$  
   b) $(\frac{1}{3})^n = 81$
   c) $(\frac{1}{2})^n = 32$  
   d) $(\frac{1}{2})^n = 4^{(n + 1)}$
   e) $(\frac{1}{2})^{(n + 1)} = 2$  
   f) $(\frac{1}{16})^n = 4$

4. Find the value of $x$ in each of the following:
   a) $3^{-x} = 27$  
   b) $2^{-x} = 128$
   c) $2^{(-x + 3)} = 64$  
   d) $4^{-x} = \frac{1}{16}$
   e) $2^{-x} = \frac{1}{256}$  
   f) $3^{(-x + 1)} = \frac{1}{81}$

5. A tap is dripping at a constant rate into a container. The level ($l$ cm) of the water in the container, is given by the equation $l = 2^t - 1$ where $t$ hours is the time taken.
   a) Calculate the level of the water after 3 hours.
   b) Calculate the level of the water in the container at the start.
   c) Calculate the time taken for the level of the water to reach 31 cm.
   d) Plot a graph showing the level of the water over the first 6 hours.
   e) From your graph, estimate the time taken for the water to reach a level of 45 cm.