

**Section 1: Exponential functions and logarithms****Section test**

- Find the value of  $\log_2 32$ .
- Find the value of  $\log_3 \left( \frac{1}{\sqrt{3}} \right)$ .
- The statement  $a^b = c$  is equivalent to the statement:  
(a)  $c = \log_a b$  (b)  $b = \log_a c$   
(c)  $a = \log_b c$  (d)  $c = \log_b a$
- If  $\log_3 x = -3$ , find  $x$ .
- $a \log b + b \log a$  can be written as  
(a)  $\log(a^b b^a)$  (b)  $ab \log(ab)$   
(c)  $(a+b) \log(ab)$  (d)  $\log(a^b + b^a)$
- $\log x - 2 \log y + \frac{1}{2} \log z$  can be written as  
(a)  $\log \left( \frac{xz}{4y} \right)$  (b)  $\log \left( \frac{x\sqrt{z}}{y^2} \right)$   
(c)  $\log \left( \frac{xz}{y} \right)$  (d)  $\log(x - y^2 + \sqrt{z})$
- Find the value of  $x$  if  $3^x = 4.2$ . Give your answer to 3 significant figures.
- Find the value of  $x$  if  $5^{-2x} = 3$ . Give your answer to 3 significant figures.
- The number  $N$  of bacteria in a culture after  $t$  hours is modelled by  $N = 1000 \times 2^{0.3t}$ .  
How many bacteria are in the culture after one complete day?  
After how many hours are there more than 10 million bacteria in the culture?
- Solve the equation  $2 \log_2 x - \log_2(x+3) = 2$