

# Indices worksheet answers

## Mathematics for A-level Science

### Practice your understanding

Simplify the following expressions:

1.  $x^3 \times x^4 = x^7$

2.  $y^9 \div y^4 = y^5$

3.  $(z^7)^3 = z^{21}$

4.  $\frac{x^4 \times x^2}{x^5} = x$

5.  $(ab)^2 \times a^3 = a^5 b^2$

6.  $b^{\frac{1}{3}} = \frac{1}{b^3}$

7.  $c^{-3} \div c^4 = c^{-7} = \frac{1}{c^7}$

8.  $\frac{(x^0 \times x^3)^2}{x^4} = x^2$

Solve the following equations for  $x$

9.  $2^{x+1} = 2^4 \quad (x = 3)$

10.  $3^{x-2} + 1 = 28 \quad (x = 5)$

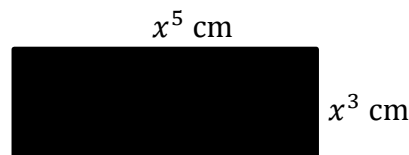
11.  $2^{x+6} = 128 \quad (x = 1)$

12.  $2(3^x)^2 = 162 \quad (x = 2)$

13.  $7^{x+4} = 343 \quad (x = -1)$

14.  $\frac{x^3 \times x^4}{x^5} = 64 \quad (x = 8)$

15. Find the area of the following rectangle. Write your answer in simplified form.



$= x^{15} \text{ cm}^2$

16. The moon is approximately  $4 \times 10^5$  kilometres away. If an astronaut was to travel to the moon and back 3 times, how far would he have travelled in space?  
 $= 2.4 \times 10^6$  kilometres

17. If that same astronaut was to travel to the moon and back  $10^3$  times, how far would he have travelled in space?  
 $= 8 \times 10^8$  kilometres