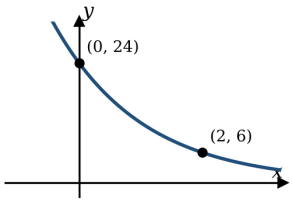
Day 100	IGCSE 10-a-day
1 The number of members of a club is decreased by 40% in one year. The next year the number of members is increased by 12%. The next year the number of members is increased by 25%. There are now 168 members. How many members were there to begin with?	
2 The temperature, T °C, of a cup of tea t minutes after it is removed from a heat source is modelled by $T = 20 + \frac{16}{t}$ $(t \geq 1)$ (a) Find $\frac{dT}{dt}$ when $t = 4$. (b) Find the value of t when the temperature is falling at 1 °C per minute.	
3 The ratio of juniors to seniors in a school is 3 : 2. 40% of the juniors and 45% of the seniors play a sport. What percentage of all of these students play a sport?	
4 Work out the exact value of $(\tan 45°)^2 + \sin 30°$ Give your answer in its simplest form, as a fraction or surd. Do not use a calculator.	
5 A curve has equation $y = x^2 - 2x - 1$. Find the equation of the normal to the curve at the point where $x = 0$.	

Day 100 **IGCSE 10-a-day**

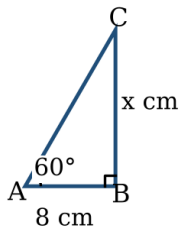
6 The line $y = 4x + k$ is a tangent to the curve $y = 3x^2 + 2x$.
Find the value of k.

7 The curve $y = x^3 + ax^2 + bx + 6$ has stationary points at $x = -3$ and $x = -1$.
Find the values of a and b.

8 The diagram shows part of the graph of $y = ab^x$.
The curve passes through (0, 24) and (2, 6).
(a) Find the values of a and b. (b) Work out the value of y when x = 3.



9 ABC is a right-angled triangle.
Work out the exact value of x. Give your answer in its simplest form.
The diagram is not drawn accurately.



10 $A = \begin{pmatrix} 1 & 2 \\ 0 & -3 \end{pmatrix}$ and $B = \begin{pmatrix} -4 \\ 0 \end{pmatrix}$.
AX = B, where X is a 2 × 1 matrix.
Find X.