Day 300	IGCSE 10-a-day
1 A curve has equation $y = x^3 + 3x^2 - 15x - 8$. Find the equations of the two tangents to the curve that are parallel to the line $y = -6x - 2$.	
2 $f(x) = -4x - 4$. (a) Find $f^{-1}(x)$. (b) Find $f^{-1}(1)$.	
3 The ratio of Year 10 students to Year 11 students in a school is 2 : 4. 45% of the Year 10 students and 30% of the Year 11 students have a part-time job. What percentage of all of these students have a part-time job?	
4 The point A lies on the curve $y = x^2 - 5x - 7$ where $x = 0$. Find the equation of the normal at A. Give your answer in the form $ax + by + c = 0$ where a, b and c are integers.	
5 Simplify fully $\frac{6x^4y^2 \times 9x^2y^3}{3x^4y^6}$ Give your answer in the form kx^ay^b	

Day 300 **IGCSE 10-a-day**

6 Simplify fully $\frac{2^{n+3} - 2^n}{7}$

7 A rectangle has length 8.5 cm and width 4.4 cm, both correct to 1 decimal place.
Work out the upper bound of the perimeter of the rectangle.

8 The table gives information about the masses of some eggs.
An estimate for the mean is 42.5.
Work out the value of x.

Mass, m (g)	Frequency
$0 < m \leq 20$	16
$20 < m \leq 40$	13
$40 < m \leq 60$	17
$60 < m \leq 80$	x
$80 < m \leq 100$	3

9 A workshop makes x tables and y chairs each week.
Each table needs 1 hour of work and 6 metres of wood. Each chair needs 6 hours of work and 3 metres of wood.
There are 30 hours of work and 48 metres of wood available.
The profit is £7 for each table and £7 for each chair.
(a) Write down two inequalities, other than $x \geq 0$, $y \geq 0$. (b) Find the greatest profit.

10 The tangent to the curve $y = x^3 - 4x^2 - 6x + 6$ at the point P where x = 1 meets the curve again at Q.
Find the coordinates of Q.