Day 261	A Tier 10-a-day
1 Factorise fully $8x^2 - 288$	
2 A triangle has sides of length 24 cm, 24 cm and 7 cm. Is the triangle right-angled? You must show your working.	
3 (a) Write 21 and 70 as products of prime factors. (b) Find the highest common factor (HCF) and the lowest common multiple (LCM) of 21 and 70.	
4 $\mathbf{a} = \begin{pmatrix} 6 \\ -5 \end{pmatrix}$ and $\mathbf{b} = \begin{pmatrix} 3 \\ -3 \end{pmatrix}$. Work out $2\mathbf{a} + 3\mathbf{b}$.	
5 A straight line passes through the points $(-3, 1)$ and $(0, 13)$. Find the equation of the line.	

Day 261 **A Tier 10-a-day**

6 Here is some information about 50 students.
(a) Work out the mean.
(b) Write down the mode.

Number of pets	0	1	2	3	4
Frequency	1	4	22	17	6

7 $\frac{2}{7}$ of the books in a library are fiction.
There are 32 fiction books.
Work out the total number of books in the library.

8 A van travels for 1 hour at 20 km/h,
then for 1 hour 30 minutes at 65 km/h.
Work out the average speed for the whole journey.

9 Solve $x^2 + 2x - 4 = 0$ by completing the square.
Give your answers in surd form.

10 A bag contains 3 black pens and 7 blue pens.
Three pens are taken at random without replacement.
Work out the probability that at least one of the three pens is blue.