Day 243	S Tier 10-a-day
1 x is an acute angle and $\cos x = \frac{8}{13}$. (a) Find the exact value of sin x. (b) Find the exact value of tan x. Give each answer as a fraction or a surd. Do not use a calculator.	
2 Factorise $2x^2 - 11x - 21$	
3 A population of members of a website starts at 200 and grows by 50% each year. After how many whole years will the population first be at least double its starting value? (Calculator)	
4 Work out the exact value of $\tan 30° \div \sin 45°$ Give your answer in its simplest form, as a fraction or surd. Do not use a calculator.	
5 Work out $16^{-\frac{7}{4}}$	

Day 243 **S Tier 10-a-day**

6 A fair 6-sided dice and a spinner numbered 1 to 5 are each thrown once. The first score and the second score are recorded.
(a) Work out the probability that the sum is greater than 5.
(b) Given that the first number is even, work out the probability that the sum is greater than 5.

7 The nth term of a sequence is $n^2 + 2n + 7$.
(a) Work out the 10th term.
(b) Is 293 a term of the sequence? You must show your working.

8 Given that $x > 0$, solve $x^{-\frac{3}{2}} = \frac{1}{64}$

9 A is the point $(-3, 0)$ and B is the point $(7, 8)$.
Find an equation of the perpendicular bisector of AB.
Give your answer in the form $ax + by = c$, where a, b and c are integers.

10 The table gives information about the masses of some eggs.
An estimate for the mean is 37.5.
Work out the value of x.

Mass, m (g)	Frequency
$10 < m \leq 20$	8
$20 < m \leq 30$	16
$30 < m \leq 40$	x
$40 < m \leq 50$	7
$50 < m \leq 60$	20