Day 137	S Tier 10-a-day
1 A flight leaves London at 21:35 (London time). It takes 13 hours 30 minutes. When it is 12:00 in London it is 21:00 in Sydney. At what time, in Sydney time, does the flight land? Say if it is on a different day.	
2 The mean of 12 numbers is 136. One number is removed and the mean of the remaining 11 numbers is 148. Work out the number that was removed.	
3 A circular arc has a chord AB of length 40 cm. The greatest distance between the chord and the arc is 4 cm. Work out the radius of the circle.	
4 Write $\frac{14}{2-\sqrt{2}}$ in the form $p + q\sqrt{2}$ where p and q are integers.	
5 Tariq and Rhys play a match. The first to win 2 chess games wins the match. The probability that Tariq wins any one of the chess games is $\frac{1}{3}$. Work out the probability that the match needs a third one to decide it.	

Day 137	S Tier 10-a-day

6 A red light flashes every 8 minutes.
A blue light flashes every 9 minutes.
A green light flashes every 24 minutes.
They all flash together at 10:00 am.
(a) At what time do they next flash together?

7 In an animal shelter, the ratio of the number of cats to the number of dogs is 7 : 3.
Then 12 cats are removed and 18 more dogs are added.
The ratio is now 4 : 3.
How many dogs were there at the start?

8 Solve $\frac{4}{x-5} - \frac{3}{x-3} = \frac{1}{2}$

9 OA = $\mathbf{a}$ and OB = $\mathbf{b}$.
OP = $5\mathbf{a} + 4\mathbf{b}$, OQ = $-\mathbf{a} + 7\mathbf{b}$ and OR = $-5\mathbf{a} + 9\mathbf{b}$.
(a) Show that P, Q and R lie on a straight line.
(b) Work out the ratio PQ : QR in its simplest form.

10 The diagram shows a sketch of a quadratic curve. It crosses the axes at the points shown.
Find an equation of the curve.
Give your answer in the form $y = ax^2 + bx + c$.

