Day 40	S Tier 10-a-day
1 Zip Taxis has a fixed charge of £4 plus £6 per mile. Go Cabs has a fixed charge of £14 plus £4 per mile. (a) Work out the number of miles for which the two costs are the same. (b) Which is cheaper for 9 miles, and by how much?	
2 The ratio of boys to girls in a school is 2 : 3. 25% of the boys and 50% of the girls walk to school. What percentage of all of these students walk to school?	
3 In triangle PQR, side QR is extended to S. Angle QPR = (2x + 10)° Angle PQR = (2x + 30)° Angle PRS = (3x + 50)° (a) Work out the value of x. (b) Work out the size of angle PRQ.	
4 (a) Write $x^2 + 8x + 21$ in the form $(x + p)^2 + q$ (b) Write down the coordinates of the turning point of the curve $y = x^2 + 8x + 21$	
5 Two cones, P and Q, are mathematically similar. The volume of P is 72 cm^3 and the volume of Q is 3087 cm^3. The curved surface area of P is 28 cm^2. Work out the curved surface area of Q.	

Day 40	S Tier 10-a-day
6 A and B are points on the curve $y = -x^2 - 2x + 1$. The x coordinate of A is 3 and the x coordinate of B is 7. Work out the gradient of the line AB.	
7 A car loses 8% of its value each year. After 3 years it is worth £9,733.60. Work out its value when it was new. (Calculator)	
8 A library has 2.5×10^4 books. Each book has 2.3×10^5 words. Work out the total number of words in all the books. Give your answer in standard form.	
9 An alloy contains 113 g of lead and 73 g of tin. The density of lead is 11.3 g/cm^3. The density of tin is 7.3 g/cm^3. Work out the density of the alloy.	
10 Show that $\sqrt{3 + 2\sqrt{2}} = 1 + \sqrt{2}$	