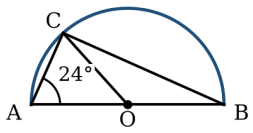
Day 66	S Tier 10-a-day
1 (a) Write $4x^2 + 40x + 105$ in the form $a(x + p)^2 + q$ (b) Write down the coordinates of the turning point of the curve $y = 4x^2 + 40x + 105$	
2 The mean of 5 numbers is 47. One number is removed and the mean of the remaining 4 numbers is 51.75. Work out the number that was removed.	
3 (a) Write 189 and 72 as products of prime factors. (b) Find the HCF and the LCM of 189 and 72. Give your answers as numbers.	
4 40 beetles in a field are caught, marked and put back. Later, a second sample of 40 beetles is caught. 2 of these are marked. (a) Work out an estimate for the number of beetles in a field. (b) State one assumption you have made.	
5 AB is a diameter of a circle, centre O. C is a point on the circle. Angle BAC = 24°. (a) Work out the size of angle ACB. (b) Work out the size of angle COB. The diagram is not drawn accurately. 	

Day 66	S Tier 10-a-day
6 Use the iteration formula $x_{n+1} = \sqrt[3]{6x_n + 6}$ with $x_0 = 1$ (Calculator) to work out x_1, x_2 and x_3. Give each answer correct to 3 decimal places.	
7 A square has sides of length $(5 + \sqrt{3})$ cm. Work out the area of the square. Give your answer in the form $a + b\sqrt{3}$	
8 Show that $\frac{x + 1}{x - 5} - \frac{5}{x - 3}$ can be written as $\frac{x^2 - 7x + 22}{(x - 5)(x - 3)}$	
9 A train travels a distance of 3500 km, correct to the nearest 50. The journey takes 425 hours, correct to the nearest 5. Work out the lower bound of the speed. Give your answer correct to 3 significant figures. (Calculator)	
10 A circle has equation $x^2 + y^2 = 289$. The point P(−15, −8) lies on the circle. (a) Find the equation of the tangent to the circle at P. Give your answer in the form $ax + by = c$, where a, b and c are integers. (b) The tangent meets the x-axis at the point T. Write down the coordinates of T.	