Day 16	S Tier 10-a-day
1 Show algebraically that the product of any two consecutive even numbers is a multiple of 8.	
2 Write these numbers in order of size, starting with the smallest. 92%, $\frac{7}{8}$, $\frac{14}{15}$, $\frac{7}{11}$	
3 (a) Solve $-2 - 3x \leq -20$ (b) n is an integer. Write down all the values of n that satisfy $-2 < 2n - 4 < 12$	
4 Here are five numbers: $3x - 1$, $x - 3$, $x - 1$, $3x$, $x + 4$. The mean of the five numbers is 7. (a) Work out the value of x. (b) Work out the range of the five numbers.	
5 Work out $(6.6 \times 10^8) + (2.8 \times 10^7)$ Give your answer in standard form.	

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6 A biased spinner lands on one of four outcomes with these probabilities. red: x; blue: 2x + 0.2; green: 3x + 0.2; yellow: 0.3 (a) Work out the value of x. (b) The biased spinner is used 200 times. Work out an estimate for the number of times it lands on red.	
7 A circle has centre C(4, 5) and passes through the point P(−2, 1). Find an equation of the circle.	
8 OA = $\mathbf{a}$ and OB = $\mathbf{b}$. OP = $-3\mathbf{a} - 3\mathbf{b}$, OQ = $-6\mathbf{a} + 6\mathbf{b}$ and OR = $-7\mathbf{a} + 9\mathbf{b}$. (a) Show that P, Q and R lie on a straight line. (b) Work out the ratio PQ : QR in its simplest form.	
9 Given that $(a + \sqrt{5})(b + \sqrt{5}) = 11 + 7\sqrt{5}$, where a and b are positive integers with a < b, find the values of a and b.	
10 ABCD is a rectangle with AB = 14 cm and AD = 9 cm. A point P inside the rectangle is such that AP ≤ 8 cm and P is nearer to AB than to AD. Work out the area of the region in which P can lie. Give your answer in terms of π.	