Day 206	IGCSE 10-a-day
1 Expand and simplify $(1 - \sqrt{3})(2 + \sqrt{3})$ Give your answer in the form $p + q\sqrt{3}$	
2 $\mathbf{a} = \begin{pmatrix} 4 \\ 2 \end{pmatrix}$ and $\mathbf{b} = \begin{pmatrix} -2 \\ 0 \end{pmatrix}$. (a) Work out $\mathbf{a} + \mathbf{b}$. (b) Work out $3\mathbf{a} - 3\mathbf{b}$.	
3 The curve $y = x^3 + 3x^2 + 9$ has two stationary points, A and B. Work out the vertical distance between A and B.	
4 A bag contains 4 red and 6 yellow cubes. Two cubes are taken at random without replacement. Work out the probability that both are red.	
5 The point P(6, 2) lies on the graph of $y = f(x)$. Write down the coordinates of the image of P on the graph of (a) $y = f(x) + 2$ (b) $y = f(-x)$	

Day 206	IGCSE 10-a-day
6 A curve has equation $y = 3x^3 - 3x + 2$. Find the equation of the normal to the curve at the point where $x = -1$.	
7 $A = 2^3 \times 7^3$ $B = 2^3 \times 7$ Write down, as a product of prime factors, (a) the HCF of A and B (b) the LCM of A and B	
8 T is inversely proportional to the square root of n. When n = 4, T = 3. Find the value of T when n = 1.	
9 OA = $\mathbf{a}$ and OB = $\mathbf{b}$. OP = $4\mathbf{a} + 5\mathbf{b}$, OQ = $7\mathbf{a} + 7\mathbf{b}$ and OR = $19\mathbf{a} + 15\mathbf{b}$. (a) Show that P, Q and R lie on a straight line. (b) Work out the ratio PQ : QR in its simplest form.	
10 $y = -x^4 + 8x^2 + 4$ Find the coordinates of the stationary points of the curve and determine the nature of each.	