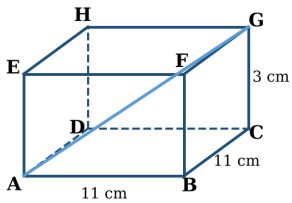
Day 68	IGCSE 10-a-day
1 A particle P moves in a straight line. After t seconds its displacement from a fixed point O is s metres, where $s = 3t^3 - 2t^2 + 3t + 4$ $(t > 0)$ Find (a) the velocity of P, (b) the acceleration of P, when $t = 3$.	
2 The ratio of Year 10 students to Year 11 students in a school is 1 : 4. 30% of the Year 10 students and 85% of the Year 11 students have a part-time job. What percentage of all of these students have a part-time job?	
3 (a) Write 1512 and 3024 as products of prime factors. (b) Find the HCF and the LCM of 1512 and 3024. Give your answers as numbers.	
4 The curve $y = x^3 + x^2 - x - 3$ crosses the y-axis at the point A. The tangent to the curve at A meets the x-axis at B. Find the coordinates of B.	
5 ABCDEFGH is a cuboid. AB = 11 cm, BC = 11 cm and CG = 3 cm. (a) Work out the length of AG. (b) Work out the size of angle GAB. Give answers to 3 significant figures or 1 decimal place. (Calculator) 	

Day 68	IGCSE 10-a-day
6 $y = 2x^3 - 3x^2 + 2$ (a) Show that there is a stationary point at $x = 1$. (b) By finding the gradient when $x = \frac{1}{2}$ and when $x = \frac{3}{2}$, decide whether it is a maximum or a minimum.	
7 The graph of $y = f(x)$ has a maximum point at $(4, 5)$. Write down the coordinates of the turning point of the graph of (a) $y = 3f(x)$ (b) $y = f(x - 1) + 5$	
8 An arithmetic sequence has term 2 equal to -24 and term 5 equal to -42. (a) Find an expression for the nth term. (b) Find the first term of the sequence that is less than -80.	
9 OA = $\mathbf{a}$ and OB = $\mathbf{b}$. OP = $3\mathbf{a} + \mathbf{b}$, OQ = $-3\mathbf{a} - 3\mathbf{b}$ and OR = $-12\mathbf{a} - 9\mathbf{b}$. (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 equation $x^2 + 6x + k = 0$ has two different real solutions. Find the range of possible values of k.	