Day 134	IGCSE 10-a-day
1 $f(x) = x^3 - 3x + 7$ Find the y coordinate of the local maximum point and the y coordinate of the local minimum point.	
2 (a) Solve $2 - 4x \geq 10$ (b) n is an integer. Write down all the values of n that satisfy $-1 < 2n - 5 \leq 9$	
3 Here are the first five terms of a quadratic sequence. $-2, -3, -6, -11, -18$ Find an expression for the nth term.	
4 A ball is thrown upwards. Its height above the ground, h metres, after t seconds is given by $h = -3t^2 + 18t + 2$ (a) Work out the greatest height reached by the ball. (b) Work out the velocity of the ball when t = 8. State whether it is moving up or down.	
5 A cyclist travels the first half of a journey at 60 km/h. It travels the second half of the same journey at 90 km/h. Work out the average speed for the whole journey.	

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6 $f(x) = 2x^3 + \frac{3750}{x}$ Find the values of x for which $f'(x) = 0$.	
7 Given that $5\sqrt{3} = \sqrt{n}$, find the value of n.	
8 A craft shop makes x necklaces and y bracelets each day. Each necklace needs 4 minutes of making time and 5 beads. Each bracelet needs 1 minute of making time and 5 beads. There are 44 minutes of making time and 70 beads available. The profit is £3 for each necklace and £2 for each bracelet. (a) Write down two inequalities, other than $x \geq 0$, $y \geq 0$. (b) Find the greatest profit.	
9 OA = $\mathbf{a}$ and OB = $\mathbf{b}$. OP = $-\mathbf{a} + 3\mathbf{b}$, OQ = $2\mathbf{a} + 6\mathbf{b}$ and OR = $3\mathbf{a} + 7\mathbf{b}$. (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 side length of a square is increased by 20%. Work out the percentage change in the area of the square.	