Day 297	IGCSE 10-a-day
1 The curve $y = x^3 + ax^2 + bx - 5$ has stationary points at $x = -1$ and $x = 3$. Find the values of a and b.	
2 Work out the value of $(p - q)^2 - (p + q)^2$ when $p = -4$, $q = 4$ and $r = -2$.	
3 $y = 2x^{5/2} + 2x^{3/2} + 2x$ Find $\frac{dy}{dx}$. Give each term of your answer in the form ax^n.	
4 a = 7.1 and b = 4.3, both correct to 1 decimal place. Work out the upper bound of a × b.	
5 $M = \begin{pmatrix} -1 & 0 \\ 0 & -1 \end{pmatrix}$. (a) Find the coordinates of the image of the point $(-3, 4)$ under the transformation represented by M. (b) Describe fully the single transformation represented by M.	

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6 The point P(−5, 3) is rotated 90° clockwise about the origin. The image is then reflected in the line y = x. (a) Write down the coordinates of the final image of P. (b) Describe fully the single transformation that is equivalent to these two transformations.	
7 A curve has equation $y = 2x^3 - 5x - 4$. Find the minimum value of the gradient of the curve, and the value of x at which it occurs.	
8 The 3rd term of a geometric sequence is 128. The 5th term of the sequence is 512. All the terms of the sequence are positive. (a) Work out the common ratio. (b) Work out the first term.	
9 p = 14.3 and r = 4.9, each correct to 1 decimal place. q = 1.34, correct to 2 decimal places. Work out the upper bound of $\frac{p - q}{r}$. Give your answer correct to 3 significant figures. (Calculator)	
10 A bag contains some beads. 7 of them are blue and the rest are black. Two beads are taken at random without replacement. The probability that both are blue is $\frac{21}{55}$. Work out how many beads are black.	