Day 37	A Level Maths: C Tier 10-a-day
1 A particle P moves in a straight line. Its displacement from O at time t seconds is s metres, where $s = t^3 + 4t^2 - 4t + 5$. Find its velocity when $t = 2$.	
2 In an arithmetic sequence $u_3 = 11$ and $u_7 = 19$. Find the first term and the common difference.	
3 $x_{n+1} = \frac{3}{x_n^2 + 1} + 1$, with $x_0 = 2$. Find x_1, x_2 and x_3 to 3 decimal places.	
4 The curve C has equation $y = x^3 - 4x^2 + 4x - 3$. C is reflected in the y-axis. Find the equation of the image.	
5 12 pairs of data on daily mean temperature and sunshine hours have $r = 0.51$. Test, at the 5% significance level, for evidence of correlation. The critical value is ±0.5760.	

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6 Express $5 \sin x + 12 \cos x$ in the form $R \cos(x - \alpha)$, where $R > 0$ and $0° < \alpha < 90°$. Give α to 1 decimal place.	
7 X has probability density function $f(x) = \frac{3}{8}x^2$ for $0 \leq x \leq 2$, and 0 otherwise. Find $P(X < 1)$.	
8 A particle of mass 3 kg slides from rest down a smooth plane inclined at angle α to the horizontal, where $\sin \alpha = \frac{3}{5}$. Take $g = 9.8$ m s^{-2}. Find (a) its acceleration, (b) its speed after 5 s.	
9 Solve $\sin x = 0.45$ for $0° \leq x \leq 360°$. Give your answers to 1 decimal place.	
10 Expand $(1 + 2x)^{-3}$ in ascending powers of x up to and including the term in x^2. State the range of values of x for which the expansion is valid.	