| Day 163 | A Level Maths: C Tier 10-a-day |
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| **1** Write $\frac{25+\sqrt{5}}{\sqrt{5}}$ in the form $p\sqrt{5}+q$. | |
| **2** A resultant force of 15 N gives a body an acceleration of 3 m $s^{-2}$. Find the mass of the body. | |
| **3** Write 3 log 2 + log 3 − log 2 as a single logarithm,<br>giving it in the form log N where N is an integer. | |
| **4** Flaws occur in a roll of cloth at an average rate of 3.5 per hour, at random.<br>Find the probability of exactly 12 in 3 hours, to 3 s.f. | |
| **5** Sketch y = \|2x − 8\|. Write down the coordinates of the vertex and of the point where the graph meets the y-axis. | |

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| **6** Given that dy/dx = 3y and y = 3 when x = 0, find y in terms of x. | |
| **7** X ~ B(30, p). $H_0$: p = 0.1, $H_1$: p > 0.1.<br>In a sample, x = 7. It is given that P(X ≥ 7) = 0.0258.<br>Test $H_0$ at the 5% significance level. | |
| **8** Expand $(1 - 3x)^{-3}$ 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. | |
| **9** A uniform rod AB of mass 6 kg and length 4 m is supported by a pivot 0.5 m from A. A particle of mass m kg is attached at A and the rod rests horizontally in equilibrium. Find m. | |
| **10** (a) Show that $x^3 - x - 7 = 0$ can be rearranged to $x = (x + 7)^{\frac{1}{3}}$.<br>(b) Use $x_{n+1}$ = this formula with $x_0 = 2$ to find $x_1$, $x_2$ to 3 d.p. | |