| Day 114 | A Level Maths: C Tier 10-a-day |
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| **1** Find an equation of the line through A(−6, 3) and B(6, −1), in the form ax + by + c = 0, where a, b and c are integers. | |
| **2** Write down the exact value of sin 225°. | |
| **3** X ~ B(15, p). $H_0$: p = 0.1, $H_1$: p < 0.1.<br>In a sample, x = 0. It is given that P(X ≤ 0) = 0.2059.<br>Test $H_0$ at the 10% significance level. | |
| **4** A cable pulls a box with a force of 12 N at an angle of 30° above the horizontal. Find the horizontal and vertical components of the force, to 3 s.f. | |
| **5** Express $\frac{x-7}{(x+1)(x+5)}$ in the form $\frac{A}{x+1}+\frac{B}{x+5}$.<br>Find the values of A and B. | |

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| **6** The table shows grouped data.<br>Class: $20 \leq x < 30$; $30 \leq x < 40$; $40 \leq x < 50$; $50 \leq x < 60$<br>Frequency: 8, 16, 16, 16<br>Estimate the median, to 3 s.f. | |
| **7** Prove by contradiction that there are no integers x and y such that $6x + 8y = 21$. | |
| **8** A line has equation $\mathbf{r} = \begin{pmatrix} -1 \\ -2 \\ -2 \end{pmatrix} + t\begin{pmatrix} -2 \\ 3 \\ 2 \end{pmatrix}$.<br>Write down a vector equation of the line through the origin, parallel to this line. | |
| **9** Two forces $(3\mathbf{i} + 3\mathbf{j})$ N and $(2\mathbf{i} - 13\mathbf{j})$ N act on a particle of mass 5 kg. No other horizontal forces act. Find the acceleration of the particle as a vector in terms of $\mathbf{i}$ and $\mathbf{j}$. | |
| **10** Sketch $y = \lvert 2x + 6 \rvert$. Write down the coordinates of the vertex and of the point where the graph meets the y-axis. | |