| Day 211 | A Level Maths: C Tier 10-a-day |
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| **1** Write $\sqrt{75}$ in the form $p\sqrt{q}$, where q is an integer as small as possible. | |
| **2** Solve $\sin x = 0.60$ for $0° \leq x \leq 360°$.<br>Give your answers to 1 decimal place. | |
| **3** The times, X minutes, taken to complete a puzzle are modelled by $N(145, 3^2)$.<br>Find $P(X < 148)$ to 3 s.f. | |
| **4** Find the first four terms, in ascending powers of x, of the expansion of $(1 + 2x)^5$. | |
| **5** Use the substitution $u = x^2 + 4$ to find<br>$\int \frac{3x}{x^2 + 4}\, dx$. | |

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| **6** A ball is projected from level ground with velocity $(3\mathbf{i} + 29.4\mathbf{j})$ m s$^{-1}$ ($\mathbf{i}$ horizontal, $\mathbf{j}$ vertically up). Take g = 9.8 m s$^{-2}$.<br>(a) Find the time of flight.<br>(b) Find the greatest height reached. | |
| **7** X ~ B(10, p). $H_0$: p = 0.3, $H_1$: p ≠ 0.3. In a sample, x = 1.<br>Test at the 5% significance level. | |
| **8** A(0, 0), B(12, −8) and C(21, −14).<br>Show that A, B and C are collinear and find AB : BC. | |
| **9** A particle moves in a straight line. Its acceleration at time t seconds is (t − 5) m s$^{-2}$. When t = 0 its velocity is 5 m s$^{-1}$.<br>Find its velocity when t = 4. | |
| **10** Expand $(1 + 4x)^{-2}$ 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. | |