| Day 311 | A Level Maths: C Tier 10-a-day |
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| **1** A horizontal force of 64 N acts on a crate of mass 50 kg on a smooth horizontal surface. Find the acceleration. | |
| **2** Express $\frac{x + 1}{(x + 2)(x + 3)}$ in the form $\frac{A}{x + 2} + \frac{B}{x + 3}$. Find the values of A and B. | |
| **3** Find the sum of the first 14 terms of the series $7 + 12 + 17 + 22 + ...$ | |
| **4** $a = -2\mathbf{j} + 3\mathbf{k}$ and $b = -3\mathbf{j} + 4\mathbf{k}$. Find the angle between a and b, to 1 decimal place. | |
| **5** 25 pairs of data on age of a car and its value have $r = 0.28$. Test, at the 5% significance level, for evidence of positive correlation. The critical value is 0.3365. | |

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| **6** A rectangle has perimeter 24 cm.<br>Find the maximum possible area of the rectangle and the dimensions that give it. | |
| **7** The nth term of an arithmetic sequence is $2n + 2$.<br>Find the smallest n for which the term exceeds 800. | |
| **8** For 10 values, $\Sigma x = 110$ and $\Sigma x^2 = 1480$.<br>Find the mean and the standard deviation. | |
| **9** A block of mass 2 kg is pulled along rough horizontal ground by a horizontal force of 12.8 N.<br>The coefficient of friction is 0.5. Take $g = 9.8$ m $s^{-2}$. Find the acceleration. | |
| **10** Find the coefficient of $x^2$ in the expansion of $(1 - x)^8$. | |