| Day 226 | A Level Maths: C Tier 10-a-day |
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| **1** (a) Convert 120° to radians, giving your answer in terms of $\pi$.<br>(b) Convert $\frac{3\pi}{4}$ radians to degrees. | |
| **2** A light plank rests on a pivot. A child of mass 30 kg sits 1 m from the pivot on one side. Where must a child of mass 25 kg sit on the other side for the plank to balance horizontally? | |
| **3** The point P(−5, −6) lies on the curve y = f(x). Write down the coordinates of the image of P on<br>(a) y = f(4x) (b) y = −f(x) | |
| **4** Differentiate y = cosec 5x with respect to x. | |
| **5** f(x) = 3x − 6 and g(x) = $x^2$ − 1.<br>Find (a) fg(x), (b) gf(x). | |

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| **6** X ~ B(60, 0.2). Find E(X) and Var(X). | |
| **7** $x^2 + kx + 16 = 0$ has equal roots.<br>Find the possible values of k. | |
| **8** Use the substitution u = sin x to find<br>$\int \cos x \sin^4 x \, dx$. | |
| **9** A lorry's engine works at a constant rate of 75 kW. Find the driving force when the vehicle is moving at 25 m $s^{-1}$. | |
| **10** 12 pairs of data on daily mean temperature and sunshine hours have r = 0.58.<br>Test, at the 5% significance level, for evidence of positive correlation. The critical value is 0.4973. | |