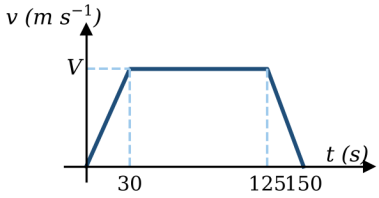
| Day 73 | A Level Maths: A Tier 10-a-day |
|---|---|
| **1** $f(x) = 4x + 5$ and $g(x) = x^2 + 6$.<br>Solve $gf(x) = 7$. | |
| **2** Solve $2\cos^2 x - 5\sin x + 1 = 0$<br>for $0° \leq x \leq 360°$. | |
| **3** The diagram shows the speed-time graph for a train journey of 1470 m. Find (a) V, (b) the deceleration in the final stage.<br> | |
| **4** The line l has equation $x + 2y = -1$.<br>(a) Find the coordinates of the foot of the perpendicular from P(1, −3) to l.<br>(b) Hence find the shortest distance from P to l, in exact form. | |
| **5** A crate of mass 5 kg is pulled at constant speed along rough horizontal ground, $\mu = \frac{1}{3}$, by a force of P N at angle $\theta$ above the horizontal, $\tan\theta = \frac{12}{5}$. Find P and the normal reaction.<br>Take g = 9.8. Give answers to 3 s.f. if not exact. | |

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|---|---|
| **6** Find the least integer n for which $3^n > 10^9$. | |
| **7** Solve $3 \times 3^{2x} - 10 \times 3^x + 3 = 0$. | |
| **8** The random variable X has pdf $f(x) = \frac{1}{8}(4 - x)$ for $0 \leq x \leq 4$, and 0 otherwise.<br>(a) Find the cumulative distribution function F(x) for $0 \leq x \leq 4$.<br>(b) Find P(X > 2). (c) Find the median of X to 3 s.f. | |
| **9** n = 9 pairs of (x, y): $\Sigma x = 124$, $\Sigma y = 234$, $\Sigma x^2 = 2590$, $\Sigma xy = 4064$.<br>(a) Find the equation of the regression line of y on x (3 s.f.).<br>(b) Estimate y when x = 13. | |
| **10** $y = (3x - 6)e^{-x}$.<br>Find the exact coordinates of the stationary point and determine its nature. | |