Day 165	A Level Maths: B Tier 10-a-day
1 Describe the single transformation that maps the graph of $y = f(x)$ onto the graph of: (a) $y = -f(x)$ (b) $y = f(x - 1)$	
2 A person of mass 60 kg stands on the floor of a lift. The lift accelerates downwards at 2 m s^{-2}. Take $g = 9.8$ m s^{-2}. Find the normal reaction between the person and the floor.	
3 A curve has parametric equations $x = -2t + 2$, $y = 2t^2 + t - 2$, $t \in \mathbb{R}$. Find a Cartesian equation of the curve in the form $y = f(x)$.	
4 Solve $3\sin^2 x + \sin x - 2 = 0$ for $0 \leq x \leq 360°$, giving answers to 1 d.p. where necessary.	
5 Solve $5^{4x-4} = 25^{-x-5}$.	

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6 For 12 pairs of values, $\bar{x} = 10$, $\bar{y} = 18$, $S_{xx} = 20$ and $S_{xy} = -10$. (a) Find the regression line of y on x in the form $y = a + bx$. (b) Estimate y when $x = 14$.	
7 A coin is dropped from rest from a bridge, 11.025 m above the ground. Take $g = 9.8$ m s^{-2}. Find (a) the time taken to reach the ground, (b) its speed on landing.	
8 (a) Write $\frac{4x + 10}{(x + 1)(x + 4)}$ in partial fractions. (b) Hence evaluate $\int_0^4 \frac{4x + 10}{(x + 1)(x + 4)}\,dx$, giving the answer as a single logarithm.	
9 The random variable X is normally distributed. $P(X < 32) = 0.1587$ and $P(X > 48) = 0.1587$. Find the mean and standard deviation (3 s.f.).	
10 Solve $e^{2x} - 10\,e^{x} + 24 = 0$, giving your answers as exact values.	