Day 79	A Level Maths: C Tier 10-a-day
1 A car of mass 1000 kg is driven along a straight horizontal road by a driving force of 600 N against a constant resistance of 400 N. Find the acceleration of the car.	
2 $f(x) = 9 \sin x + 12 \cos x + 6$. Write f(x) in the form $R \sin(x + \alpha) + 6$, with α in degrees to 1 d.p., and state the maximum value of f(x).	
3 A circle has equation $(x - 3)^2 + (y + 4)^2 = 8$. Write down the centre and the radius of the circle.	
4 $\frac{3x + 9}{(x + 4)(x + 1)} \equiv \frac{A}{x + 4} + \frac{B}{x + 1}$. Find A and B, and hence find $\int \frac{3x + 9}{(x + 4)(x + 1)}\, dx$.	
5 For 12 values, $\Sigma x = 144$ and $\Sigma x^2 = 2040$. Find the mean and the standard deviation.	

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6 Expand $(1 - 2x)^{-\frac{1}{2}}$ 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.	
7 Two forces of magnitudes 8 N and 15 N act on a boat at right angles to each other. Find (a) the magnitude of the resultant, (b) the angle it makes with the 8 N force, to 1 d.p.	
8 The curve $y = ab^x$ passes through (0, 4) and (4, 324). Find the values of a and b.	
9 The line $y = -3x + k$ is a tangent to the curve $y = x^2 + 3x + 6$. Find the value of k.	
10 The values x are coded using $y = (x - 10) \div 2$. The coded values have mean $\bar{y} = 0.9$ and standard deviation 1.1. Find the mean and standard deviation of x.	