Day 111	A Level Maths: C Tier 10-a-day
1 A horizontal force of 12 N acts on a crate of mass 20 kg on a smooth horizontal surface. Find the acceleration.	
2 The product moment correlation coefficient between hours of sunshine and ice cream sales is $r = -0.77$. Interpret this value.	
3 A population of 400 grows by 8% each year. After how many whole years will it first exceed 1200?	
4 $f(x) = (x - 4)^2 + 6, x \geq 0$. Find the range of f.	
5 Each customer buys a coffee with probability 0.2. Find the probability that at least one of 9 customers buys a coffee, to 3 s.f.	

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6 A particle moves in a straight line. Its velocity at time t seconds ($0 \leq t \leq 8$) is $v = (-4t^2 + 32t)$ m s^{-1}. Find the maximum velocity and the time at which it occurs.	
7 Prove by contradiction that if $3n + 6$ is even, then n is even, where n is an integer.	
8 $\frac{-x + 2}{(x + 4)(x + 2)} \equiv \frac{A}{x + 4} + \frac{B}{x + 2}$. Find A and B, and hence find $\int \frac{-x + 2}{(x + 4)(x + 2)}\, dx$.	
9 A curve has parametric equations $x = t + 1$, $y = 4t^2 - 3$. Find a Cartesian equation of the curve.	
10 Solve $2\cos^2 x - \cos x - 1 = 0$ for $0° \leq x \leq 360°$.	