Day 105	A Level Maths: C Tier 10-a-day
1 (a) Convert $\frac{\pi}{2}$ radians to degrees. (b) Convert 75° to radians, giving your answer in terms of π.	
2 Sketch $y = (x + 5)(x - 3)(x - 5)$. Write down the coordinates of the points where the curve meets the axes.	
3 A car of mass 800 kg tows a caravan of mass 1000 kg on a level road with acceleration 1 m s^{-2}. Resistances: 200 N on the car, 200 N on the caravan. Find the driving force and the tow bar tension.	
4 A sequence is defined by $u_{n+2} = u_{n+1} + u_n$, with $u_1 = 1$ and $u_2 = 2$. Find u_6.	
5 For 40 values, $\Sigma x = 1000$ and $\Sigma x^2 = 25800$. Find the mean and the standard deviation.	

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6 The line $y = -3x + k$ is a tangent to the curve $y = x^2 - 5x - 4$. Find the value of k.	
7 Use integration by parts to find $\int \ln x \, dx$.	
8 The velocity of a ball is $(-9\mathbf{i} + 12\mathbf{j})$ m s^{-1}, where $\mathbf{i}$ and $\mathbf{j}$ are perpendicular unit vectors. (a) Find the speed. (b) Find the acute angle between the direction of motion and the line of $\mathbf{i}$. Give 1 d.p.	
9 A sector has radius 4 cm and arc length 6.00 cm. Find the angle of the sector in radians and the area of the sector.	
10 Here are 7 values: 17, 3, 14, 18, 11, 14, 18 Find the mean and the standard deviation, to 3 s.f.	