Day 228	A Level Maths: C Tier 10-a-day
1 Classify each variable as qualitative, discrete or continuous. (a) the number of cars in a car park (b) a person's favourite colour (c) the mass of a newborn baby	
2 Write down the exact values of (a) sec 315° (b) sec 135°	
3 Expand and simplify $(7 - \sqrt{6})^2$.	
4 A cricket ball is projected vertically upwards with speed 35 m s^{-1} from ground level. Taking g = 9.8 m s^{-2}, find the maximum height it reaches above the ground.	
5 The curve $y = x^2 - x + 1$ is translated by the vector $\begin{pmatrix} 1 \\ -3 \end{pmatrix}$. Find the equation of the new curve, giving your answer in the form $y = ax^2 + bx + c$.	

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6 $a = \begin{pmatrix}3\\3\end{pmatrix}$ and $b = \begin{pmatrix}-6\\-6\end{pmatrix}$. Show that a and b are parallel and find the ratio $\lvert b\rvert : \lvert a\rvert$.	
7 Evaluate $\sum_{r=1}^{20} (3r + 6)$.	
8 Solve $-2\sin^2 x + 3\cos x + 3 = 0$ for $0° \leq x \leq 360°$.	
9 A car of mass 1500 kg tows a caravan of mass 800 kg on a level road with acceleration 1 m s^{-2}. Resistances: 200 N on the car, 100 N on the caravan. Find the driving force and the tow bar tension.	
10 The discrete random variable X has this distribution. x: 0, 3, 6, 8 P(X = x): 0.2, 0.2, 0.3, 0.3 Find E(X) and Var(X).	