Day 288	A Level Maths: C Tier 10-a-day
1 Solve (a) $e^x = 12$ (b) $\ln x = 0.5$ Give answers to 3 significant figures.	
2 A curve has parametric equations $x = 4t - 5$, $y = 2t^2 - 6$. The point P has y-coordinate -4 and positive t. Find the coordinates of P.	
3 Seven daily rainfall readings (mm) from the Large Data Set are: 2, tr, 3.2, 2.8, tr, 3.6, 3.4. Here 'tr' means a trace, which is treated as 0. Find the mean daily rainfall to 3 s.f.	
4 A particle moves with constant velocity $(-2\mathbf{i} + 3\mathbf{j})$ m s^{-1}. It is at the point with position vector $(\mathbf{i} + 2\mathbf{j})$ m at t = 0. Find the time when its position vector is $(-11\mathbf{i} + 20\mathbf{j})$ m.	
5 A line has equation $\mathbf{r} = \begin{pmatrix}1\\3\\1\end{pmatrix} + t\begin{pmatrix}3\\3\\-2\end{pmatrix}$. Show that the point (13, 15, -7) lies on the line.	

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6 In an arithmetic sequence $u_5 = 11$ and $u_7 = 15$. Find the first term and the common difference.	
7 Express $\frac{-x+1}{(x+2)(x+5)}$ in the form $\frac{A}{x+2} + \frac{B}{x+5}$. Find the values of A and B.	
8 X ~ B(100, 0.5). Use a normal approximation to find P(X ≥ 55), to 3 s.f.	
9 A lamp of weight 48 N hangs from a light string, pulled aside by a horizontal force P N so that the string makes an angle θ with the vertical, where $\tan\theta = \frac{5}{12}$. Find P and the tension T N.	
10 The line $y = 4x + k$ is a tangent to the curve $y = x^2 + 8x - 3$. Find the value of k.	