Day 301	A Level Maths: C Tier 10-a-day
1 In a model, a beam is modelled as a rod. State what this assumption means for the motion or forces in the model.	
2 The vector $\mathbf{p} = 24\mathbf{i} - 7\mathbf{j}$. Find (a) $\lvert\mathbf{p}\rvert$, (b) the angle p makes with the positive x-axis, measured anticlockwise (1 d.p.).	
3 A circle has equation $x^2 + y^2 - 12x - 10y + 33 = 0$. Find the centre and the radius of the circle.	
4 The heights in cm for two groups: Group A has mean 59, standard deviation 14; Group B has mean 79, standard deviation 5. Compare the two sets of data.	
5 $f(x) = x^2$, $x \geq 0$. Find $f^{-1}(x)$ and state its domain.	

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6 Car A passes a point O at constant speed 6 m s^{-1}. At that instant car B starts from rest at O with constant acceleration 1 m s^{-2} in the same direction. Find the time when B catches up A.	
7 A line has equation $\mathbf{r} = \begin{pmatrix} -1 \\ -2 \\ 1 \end{pmatrix} + t\begin{pmatrix} 2 \\ 1 \\ 1 \end{pmatrix}$. Show that the point $(-3, -3, 0)$ lies on the line.	
8 X ~ B(25, 0.6). Find E(X) and Var(X).	
9 $\frac{-3x-5}{(x+1)(x+3)} \equiv \frac{A}{x+1} + \frac{B}{x+3}$. Find A and B, and hence find $\int \frac{-3x-5}{(x+1)(x+3)}\,dx$.	
10 Write $3x^2 - 12x + 4$ in the form $a(x+p)^2 + q$.	