Day 331	A Level Maths: B Tier 10-a-day
1 Two forces $(8\mathbf{i} - 3\mathbf{j})$ N and $(4\mathbf{i} - 6\mathbf{j})$ N act on a particle of mass 3 kg. Find the magnitude of the acceleration of the particle.	
2 Solve $\tan 2x = -3.1$ for $0 \leq x \leq 360°$, giving answers to 1 d.p.	
3 The curve $y = x^2 + 5x + 4$ and the line $y = 5x + 5$ meet at the points A and B. Find the coordinates of A and B.	
4 A has position vector $\begin{pmatrix} 5 \\ 0 \end{pmatrix}$ and B has position vector $\begin{pmatrix} -1 \\ 6 \end{pmatrix}$. The point P lies on AB with AP : PB = 2 : 1. Find the position vector of P.	
5 A sledge of mass 5 kg is pulled across smooth horizontal ice by a rope with tension 39 N, inclined at α above the horizontal, where $\tan \alpha = \frac{5}{12}$. Take $g = 9.8$ m s^{-2}. Find (a) the acceleration of the sledge, (b) the normal reaction of the ice.	

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6 Given that each lottery ticket wins a prize independently with probability 0.05, find the least number of tickets needed for the probability of at least one success to exceed 0.95.	
7 Simplify $\frac{4}{\sqrt{2}} + \sqrt{18}$, giving your answer in the form $k\sqrt{2}$.	
8 A manufacturer claims that a proportion 0.4 of its sweets are red. A sample of 15 sweets has 2 red. Test, at the 1% level, whether the true proportion is lower than claimed.	
9 Solve $\sin 2x = 0.2$ for $0 \leq x \leq \pi$, giving answers to 3 significant figures.	
10 The line $4x + 3y = k$ is a tangent to the circle $(x + 3)^2 + (y + 3)^2 = 100$. Find the two possible values of k.	