Day 317	A Level Maths: C Tier 10-a-day
1 A skier starts from rest and moves in a straight line with constant acceleration 0.5 m s^{-2}. It travels 16 m. Find the time taken.	
2 The vector $\mathbf{p} = -12\mathbf{i} - 5\mathbf{j}$. Find (a) $\lvert\mathbf{p}\rvert$, (b) the angle p makes with the positive x-axis, measured anticlockwise (1 d.p.).	
3 Find the set of values of k for which $2x^2 + 4x + k = 0$ has no real roots.	
4 $\mathrm{OA} = \begin{pmatrix} 3 \\ 3 \\ -1 \end{pmatrix}$ and $\mathrm{OB} = \begin{pmatrix} 0 \\ -9 \\ -5 \end{pmatrix}$. Find AB and |AB|, and a unit vector in the direction of AB.	
5 A company says that the probability a customer buys a ticket is 0.75. A researcher believes that the probability is higher. Let p be the probability that customer buys a ticket. Write down suitable hypotheses for a test on p.	

Day 317	A Level Maths: C Tier 10-a-day
6 When $x^3 + kx^2 - 4x + 16$ is divided by $(x - 2)$, the remainder is 8. Find the value of k.	
7 Car A passes a point O at constant speed 3 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.	
8 The line $y = -\frac{1}{2}x + 3$ is perpendicular to the line $y = kx - 5$. Find the value of k.	
9 X ~ B(20, p). H_0: p = 0.3, H_1: p < 0.3. Find the critical region for a test at the 5% significance level.	
10 Variables x and y satisfy $y = ab^x$. A graph of $\log_{10} y$ against x is a straight line with gradient 0.5 and intercept 1.5. Find a and b to 3 significant figures.	