Day 184	A Level Maths: C Tier 10-a-day
1 Write $3x^2 + 18x + 33$ in the form $a(x + p)^2 + q$.	
2 A has coordinates (0, 3, 2) and B has coordinates $(-2, 0, 8)$. Find (a) the vector AB, (b) the distance AB, (c) the midpoint of AB.	
3 A bag has 6 red and 4 blue sweets. Two are taken at random without replacement. Find the probability that at least one of them is red.	
4 A boat travels 9 m at a constant speed of 3 m s^{-1}, then a further 14 m at a constant speed of 2 m s^{-1}. Find the average speed for the whole journey.	
5 $\mathbf{a} = \mathbf{i} + \mathbf{j} - \mathbf{k}$ and $\mathbf{b} = -2\mathbf{i} - 2\mathbf{j} - 3\mathbf{k}$. Find the angle between a and b, to 1 decimal place.	

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6 Sketch $y = \frac{-2}{x-1} - 3$. Write down the equations of the asymptotes and the coordinates where the curve meets the axes.	
7 $X \sim N(55, 2^2)$. Find $P(X > 57)$, giving your answer to 3 s.f.	
8 A particle moves with constant velocity $(5\mathbf{i} + 2\mathbf{j})$ m s^{-1}. It is at the point with position vector $(-2\mathbf{j})$ m at t = 0. Find the time when its position vector is $(20\mathbf{i} + 6\mathbf{j})$ m.	
9 Solve $\cos x(2\cos x - 1) = 0$ for $0° \leq x \leq 360°$.	
10 Find the set of values of x satisfying both $3x + 1 < 1$ and $x^2 - 3x - 10 < 0$.	