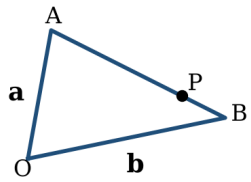
Day 40	A Level Maths: C Tier 10-a-day
1 The vector p = 8**i** + 6**j**. Find (a) |p|, (b) the angle p makes with the positive x-axis, measured anticlockwise (1 d.p.).	
2 For a data set $Q_1 = 58$ and $Q_3 = 86$. A value is an outlier if it is more than 1.5 × IQR above Q_3 or below Q_1. Determine whether 10 and 15 are outliers.	
3 Three forces (3**i** + 3**j**) N, (p**i** + q**j**) N and (−2**i** − 7**j**) N act on a particle which is in equilibrium. **i** and **j** are perpendicular unit vectors. Find the values of p and q.	
4 Each shot hits the target with probability 0.5. Find the probability of at least one hit in 7 shots, to 3 s.f.	
5 $f(x) = e^x - 3$. Use the Newton-Raphson method with $x_0 = 1$ to find x_1, giving your answer to 3 decimal places.	

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6 A geometric series has first term 12 and common ratio $\frac{1}{4}$. Find the sum to infinity.	
7 In the diagram, OA = **a**, OB = **b**, and P lies on AB with AP : PB = 3 : 1. Find AB and OP in terms of **a** and **b**. 	
8 Simplify $(3x^4)^2 \div 9x^{-2}$.	
9 Car A passes a point O at constant speed 7 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.	
10 $(x - 2)$ is a factor of $x^3 + kx^2 + 5x - 6$. Find the value of k.	