Day 210	A Level Maths: B Tier 10-a-day
1 Two forces of magnitude 6 N and 8 N act at right angles on a particle. Find the magnitude of the resultant, and the angle it makes with the 6 N force, to 1 d.p.	
2 The points A and B have coordinates $(-6, -5)$ and $(4, 3)$. (a) Find the midpoint of AB. (b) Find the line AB as $ax + by + c = 0$, with integer a, b, c.	
3 A sector of a circle has radius 14 cm and angle 120°. Find the perimeter of the sector, in terms of π.	
4 In the binomial expansion of $(1 + kx)^n$, where n is a positive integer, the coefficient of x is 12 and the coefficient of x^2 is 54. Find the values of n and k.	
5 Find the coordinates of the stationary point of the curve $y = 2x - \ln x$, and determine its nature.	

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6 A cyclist moving in a straight line with constant acceleration increases its speed from 15 m s^{-1} to 21 m s^{-1} while covering 54 m. Find (a) the acceleration, (b) the time taken.	
7 X ~ B(50, p). H_0: p = 0.25 is to be tested against H_1: p > 0.25 at the 10% significance level. Find the critical region and the actual significance level.	
8 Solve the equation $3^{2x} - 4\times3^{x} + 3 = 0$.	
9 Given that $12\cos\theta + 5\sin\theta \equiv 13\cos(\theta - 22.6°)$, find the greatest value of $\frac{1}{(16 + 12\cos\theta + 5\sin\theta)}$.	
10 A battery lasts X hours, normal with mean 50, s.d. 1.5. Find, to 3 s.f., the probability a value is (a) more than 51.5, (b) between 51.5 and 52.2.	