Day 123	A Level Maths: B Tier 10-a-day
1 A police car starts from rest and accelerates at 2 m s^{-2}. At that moment it is passed by a speeding van travelling at constant speed 17 m s^{-1}. Find how long it takes to catch up, and the distance travelled.	
2 Solve $\tan x = 0.5$ for $0 \leq x \leq 2\pi$, giving answers to 3 significant figures.	
3 The points A, B and C are (3, 1), (−1, 4) and (2, 8). (a) Show that angle ABC = 90°. (b) Find the area of triangle ABC.	
4 A car moving in a straight line with constant acceleration increases its speed from 9 m s^{-1} to 13.5 m s^{-1} while covering 101.25 m. Find (a) the acceleration, (b) the time taken.	
5 Solve $(x - 3)(x - 2)(x - 5) > 0$.	

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6 The radius of a circular oil slick increases at 1.5 cm per second. Find the rate at which its area is increasing when r = 4 cm, in terms of π.	
7 The masses (kg) of parcels are normally distributed. P(X < 48) = 0.1587 and P(X > 72) = 0.1587. Find the mean and standard deviation (3 s.f.).	
8 Given that $7\cos\theta + 24\sin\theta \equiv 25\cos(\theta - 73.7°)$, find the greatest value of $\frac{1}{(27 + 7\cos\theta + 24\sin\theta)}$.	
9 Solve the equation $5^{2x} - 120\times5^{x} - 625 = 0$.	
10 A manufacturer claims that a proportion 0.5 of its sweets are red. A sample of 25 sweets has 14 red. Test, at the 5% level, whether the true proportion is higher than claimed.	