Day 317	A Level Maths: B Tier 10-a-day
1 Solve $3^x = 2^{x+2}$, giving your answer to 3 s.f.	
2 The line $y = -x - 12$ meets the circle $x^2 + (y + 3)^2 = 65$ at the points A and B. Find the coordinates of A and B, and the exact length of the chord AB.	
3 Solve $\tan x = 2$ for $0 \leq x \leq 2\pi$, giving answers to 3 significant figures.	
4 The length X cm of a metal rod is normal with mean 30, s.d. 5. Find k (3 s.f.): (a) $P(X < k) = 0.1$, (b) $P(X > k) = 0.05$.	
5 Prove that $(2n + 5)^2 - (2n - 5)^2$ is a multiple of 40 for all integer values of n.	

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6 A particle moves in a straight line. At time t seconds its acceleration is $4t + 3$ m s^{-2}. When t = 0 the velocity is -3 m s^{-1}. Find the velocity when t = 4.	
7 (a) Expand $(1 + 3x)^{-2}$ up to the x^2 term. (b) Use x = 0.03 to estimate $\frac{1}{1.09^2}$ to 5 decimal places.	
8 X ~ B(11, 0.4) and Y ~ B(7, 0.25) are independent. Find P(X = 4 and Y ≤ 2), to 3 significant figures.	
9 Solve $5\sin^2 x - 2\cos x - 2 = 0$ for $0 \leq x \leq 360°$, giving answers to 1 d.p. where necessary.	
10 A particle is in equilibrium under three forces: P N at angle θ above the positive x-axis, a force of 24 N in the negative x-direction and a force of Q N in the negative y-direction. $\cos\theta = \frac{8}{17}$. Find P and Q.	