Day 254	A Level Maths: C Tier 10-a-day
1 Of 130 people, 66 are girls. 26 of the girls and 47 of the boys play an instrument. One person is chosen at random. Given that the person is a girl, find the probability that they play an instrument.	
2 A is (4, −6) and B is (14, −8). Find (a) the midpoint of AB, (b) the length of AB, as a surd in simplest form.	
3 Solve $(\cos x - 1)(\cos x + 1) = 0$ for $0° \leq x \leq 360°$.	
4 A particle moves in a straight line. Its acceleration at time t seconds is $(4t + 2)$ m s^{-2}. When $t = 0$ its velocity is 6 m s^{-1}. Find its velocity when $t = 4$.	
5 A population is $N(\mu, 8^2)$. H_0: $\mu = 195$, H_1: $\mu < 195$. A sample of 36 has mean $\bar{x} = 192.07$. Test at the 5% level. Critical value: $z = -1.645$.	

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6 A block of mass 4 kg is pulled along rough horizontal ground by a horizontal force of 17.68 N. The coefficient of friction is 0.4. Take g = 9.8 m s^{-2}. Find the acceleration.	
7 The number of bacteria is $N = 800\ e^{0.02t}$, where t is the time in hours. Find (a) N when t = 10, (b) the time when N = 1600. Give answers to 3 s.f.	
8 Express $\frac{5x - 3}{(x + 2)^2}$ in the form $\frac{A}{(x + 2)} + \frac{B}{(x + 2)^2}$.	
9 Solve $2 \times 7^x = 10$. Give your answer to 3 significant figures.	
10 A is (−6, −5) and B is (−4, −5). AB is a diameter of a circle. Find the equation of the circle.	