Day 140	A Level Maths: C Tier 10-a-day
1 Find $\int (4x + 1)^3 \, dx$.	
2 The table summarises the number of pets owned by 50 people. Pets, x: 1, 2, 3, 4, 5 Frequency, f: 9, 17, 13, 3, 8 Find the mean.	
3 The point P(−4, −2) lies on the curve y = f(x). Write down the coordinates of the image of P on (a) y = f(x) + 5 (b) y = f(4x)	
4 Find the exact value, in radians, of (a) $\arccos(\frac{1}{2})$ (b) arcsin(1)	
5 Find the sum of the first 24 terms of the series −5 − 3 − 1 + 1 + ...	

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6 Solve $\cos^2 x + \cos x = 0$ for $0° \leq x \leq 360°$.	
7 In a geometric sequence $u_2 = -4$ and $u_3 = 8$. Find the first term and the common ratio.	
8 A uniform beam AB of mass 30 kg and length 8 m rests horizontally on supports at A and B. A load of mass 20 kg is placed on the beam 6 m from A. Take $g = 9.8$ m s^{-2}. Find the reaction at B. 	
9 A population is $N(\mu, 10^2)$. H_0: $\mu = 40$, H_1: $\mu \neq 40$. A sample of 36 has mean $\bar{x} = 44.17$. Test at the 5% level. Critical value: $z = \pm 1.96$.	
10 A ball is dropped from rest from the top of a cliff of height 4.9 m. Take $g = 9.8$ m s^{-2} and ignore air resistance. Find (a) the time taken to reach the ground, (b) its speed on hitting the ground.	