Day 123	A Level Maths: C Tier 10-a-day
1 For a data set $Q_1 = 23$ and $Q_3 = 39$. A value is an outlier if it is more than 1.5 × IQR above Q_3 or below Q_1. Determine whether 0 and 2 are outliers.	
2 A particle of mass 8 kg hangs from a light string and is raised vertically with acceleration 0.5 m s^{-2}. Taking g = 9.8 m s^{-2}, find the tension.	
3 A sector has radius 10 cm and angle $\frac{\pi}{2}$ radians. Find the arc length, leaving π in your answer, and the perimeter.	
4 Show, by a counter-example, that the statement "If n^2 is a multiple of 50 then n is a multiple of 50" is false, where n is a positive integer.	
5 A particle of mass 8 kg slides from rest down a smooth plane inclined at angle α to the horizontal, where $\sin\alpha = \frac{4}{5}$. Take g = 9.8 m s^{-2}. Find (a) its acceleration, (b) its speed after 3 s.	

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6 Find the sum of the first 6 terms of the geometric series 1 + 4 + 16 + ...	
7 Solve $-6\sin^2 x - 3\cos x + 3 = 0$ for $0° \leq x \leq 360°$.	
8 The table shows grouped data. Class: $20 \leq x < 25$; $25 \leq x < 30$; $30 \leq x < 35$; $35 \leq x < 40$ Frequency: 7, 7, 8, 12 Estimate the mean, to 3 s.f.	
9 Express $15 \sin x + 8 \cos x$ in the form $R \sin(x + \alpha)$, where $R > 0$ and $0° < \alpha < 90°$. Give α to 1 decimal place.	
10 Expand $(1 - 3x)^{-2}$ in ascending powers of x up to and including the term in x^2. State the range of values of x for which the expansion is valid.	