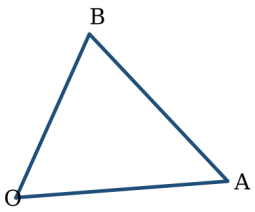
Day 56 **A Level Maths: B Tier 10-a-day**

1 Ordered data, texts sent in a day by 11 students:
12, 12, 13, 19, 25, 27, 30, 31, 37, 38, 39.
Find Q_1, Q_3, the IQR and any outliers (more than 1.5 × IQR beyond a quartile).

2 In triangle OAB, OA = a and OB = b. M lies on AB with AM : MB = 1 : 2, and N lies on OB with ON : NB = 1 : 3.
Find OM and NM in terms of a and b.



3 A particle moves in a straight line. At time t seconds its velocity is $v = t^2 + 2t + 6$ m s^{-1}.
Find the distance moved between t = 2 and t = 5. (The particle does not change direction.)

4 Find the exact value of
$\int_0^{\frac{\pi}{2}} \frac{\cos x}{\sin x + 1}\,dx$,
giving your answer in the form a ln b.

5 $f(x) = x^2 - 2x + 3$ for $x \geq 1$.
Find $f^{-1}(x)$ and state its domain.

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6 R: it rains; L: Ali is late. P(R) = 0.6, P(L | R) = 0.5, P(L | R') = 0.1. (a) Find P(L). (b) Find P(R | L).	
7 Given that $\cos\theta + 3\sin\theta \equiv \sqrt{10}\cos(\theta - 71.6°)$, solve $\cos\theta + 3\sin\theta = 0.5$ for $0 \leq \theta \leq 360°$. (1 d.p.)	
8 A ball is kicked from horizontal ground with speed 49 m s^{-1} at an angle θ above the horizontal, where $\tan\theta = \frac{4}{3}$. Take g = 9.8 m s^{-2}. Find (a) the time of flight, (b) the horizontal range.	
9 Prove by contradiction that there are no integers m and n such that 18m + 24n = 64.	
10 $f(x) = 2x^3 - 2x^2 + kx + 18$. Given that (x + 3) is a factor of f(x), (a) find the value of k, (b) factorise f(x) completely.	