Day 134 **A Level Maths: B Tier 10-a-day**

1 The table shows the number of siblings, x, of 41 students.
Calculate the mean and standard deviation (3 s.f.).

x	2	3	4	5	6	7
Frequency	6	9	8	4	10	4

2 Given that $\cot\theta = 3$ and θ is acute,
find the exact value of $\operatorname{cosec}\theta$.

3 A circle has centre $(-2, -1)$ and passes through the point $(-5, 2)$.
Find an equation of the circle.

4 A bag has 4 white and 5 black sweets; two are taken without replacement.
(a) Find P(exactly one white).
(b) Find P(at least one white).

5 Given that $21\cos\theta + 20\sin\theta \equiv 29\cos(\theta - 43.6°)$,
solve $21\cos\theta + 20\sin\theta = -5$ for $0 \leq \theta \leq 360°$. (1 d.p.)

Day 134	A Level Maths: B Tier 10-a-day
6 The curve C has equation $y = x^2 - 4x + 2$. C is stretched by scale factor 3 parallel to the y-axis. Find its new equation.	
7 A stone is dropped from rest from a bridge, 4.9 m above the ground. Take $g = 9.8\ m\ s^{-2}$. Find (a) the time taken to reach the ground, (b) its speed on landing.	
8 Find the coefficient of x^3 in the expansion of $(2 + 4x)(1 + 2x)^4$.	
9 A particle moves on a straight line. Its displacement from O at time t seconds is $s = 4t^3 - t^2 + t$ metres. Find its velocity and acceleration when $t = 3$.	
10 Given that $y = \frac{x^2 + 4}{4x + 3}$, find $\frac{dy}{dx}$, and its value when $x = 3$.	