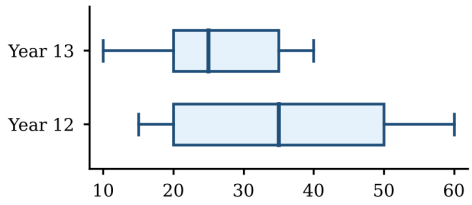
Day 275	A Level Maths: B Tier 10-a-day
1 The first term of an arithmetic series is 9 and the common difference is 6. The sum of the first n terms is 1080. Find the value of n.	
2 Given that $y = \ln(4x^2 + 3)$, find $\frac{dy}{dx}$, and the gradient of the curve when $x = 2$.	
3 Two forces $(-3\mathbf{i} + 8\mathbf{j})$ N and $(-4\mathbf{j})$ N act on a particle of mass 4 kg. Find the magnitude of the acceleration of the particle.	
4 A sector of a circle has radius 12 cm and area $\frac{144\pi}{5}$ cm^2. Find the angle of the sector in degrees.	
5 X has a binomial distribution with mean 1.6 and variance 1.28. (a) Find n and p. (b) Find P(X = 1) to 3 significant figures.	

Day 275 **A Level Maths: B Tier 10-a-day**

6 Line l_1 has equation $7x - y = 35$ and line l_2 has equation $7x - 12y = -42$.
The lines meet at P. Find the area of the triangle formed by l_1, l_2 and the x-axis.

7 Solve $3 \sin x + 5 \cos^2 x - 5 = 0$ for $0 \leq x \leq 360°$,
giving answers to 1 d.p. where necessary.

8 The box plots show the marks in a mock exam for two groups.
(a) Find the interquartile range of each group.
(b) Compare the two distributions.



9 Prove, by exhaustion, that a cube number cannot be written in the form $7k + 2$, where k is an integer.

10 A block of mass 3 kg is projected along a rough horizontal surface with speed 8.4 m s^{-1} and comes to rest after sliding 12 m.
Take $g = 9.8$ m s^{-2}.
Use work and energy to find the coefficient of friction.