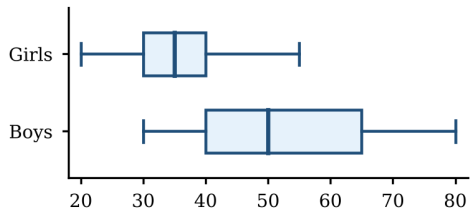
Day 181 **A Level Maths: B Tier 10-a-day**

1 A person of mass 70 kg stands on the floor of a lift. The lift accelerates upwards at 2 m s^{-2}.
Take g = 9.8 m s^{-2}.
Find the normal reaction between the person and the floor.

2 Simplify $\frac{(2x^3)^2 \times x}{x^5}$.

3 Points A, B and C have position vectors $\begin{pmatrix} -3 \\ -3 \\ 1 \end{pmatrix}$, $\begin{pmatrix} -6 \\ -5 \\ 0 \end{pmatrix}$ and $\begin{pmatrix} p \\ -7 \\ -1 \end{pmatrix}$ respectively.
Given that A, B, C are collinear, find p.

4 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.



5 Use integration by parts to find the exact value of
$\int_0^{\frac{\pi}{2}} (2x - 1) \cos x \, dx$.

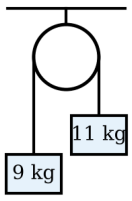
Day 181	A Level Maths: B Tier 10-a-day

6 For 11 pairs of data, $S_{xx} = 200$, $S_{yy} = 100$ and $S_{xy} = -127$.
Find the PMCC (3 s.f.) and describe the correlation.

7 Solve $\tan^2 x - 5 \sec x + 7 = 0$ for $0 \leq x \leq 360°$, giving answers to 1 d.p.

8 Solve $|2x + 6| = |x|$.

9 Particles of mass 9 kg and 11 kg hang on a light string over a smooth fixed pulley, as shown, and are released from rest. Take $g = 9.8$ m s^{-2}.
Find the acceleration and the tension in the string.



10 The diagram shows the curve $y = f(x)$. A and B are the turning points. Find the turning points of:

(a) $y = f(\frac{x}{2})$ (b) $y = f(x - 5)$

