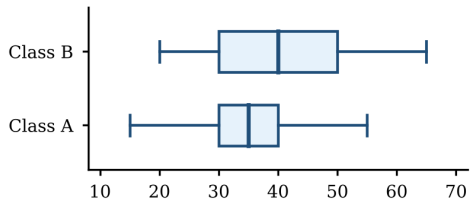
Day 152 **A Level Maths: B Tier 10-a-day**

1 Find the coefficient of x^2 in the expansion of $(2 - x)^9$.

2 The box plots show the times taken (minutes) to complete a puzzle for two groups.
(a) Find the interquartile range of each group.
(b) Compare the two distributions.



3 Use integration by parts to find the exact value of

$$\int_0^2 xe^{-2x}\,dx.$$

4 A car of mass 1000 kg moves along a horizontal road. The engine works at a constant rate of 60 kW. The resistance to motion is constant at 600 N.
Find the acceleration when the speed is 20 m s^{-1}.

5 Simplify $\frac{1 + \cos 2x}{2 \cos x}$,
giving your answer as a single trigonometric term.

Day 152	A Level Maths: B Tier 10-a-day
6 X ~ B(11, 0.5) and Y ~ B(8, 0.25) are independent. Find P(X = 7 and Y ≤ 3), to 3 significant figures.	
7 (a) Expand $(9 - 2x)^{\frac{1}{2}}$ in ascending powers of x up to and including the term in x^3. (b) State the range of values of x for which the expansion is valid.	
8 Solve $2\tan^2 x - \sec x - 1 = 0$ for $0 \leq x \leq 360°$, giving answers to 1 d.p.	
9 Given that $\sqrt{3}$ is irrational, prove by contradiction that $5 + 2\sqrt{3}$ is irrational.	
10 A block of mass 5 kg is held on a rough plane ($\tan\alpha = \frac{3}{4}$, $\mu = 0.2$) by a force P N up the plane, as shown. Take g = 9.8 m s^{-2}. The block is about to move up the plane. Find P. 