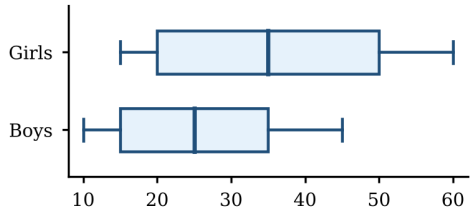
Day 45	A Level Maths: B Tier 10-a-day

1 The function $f(x) = x^3 - 1x - 2$.
Show that $f(x) = 0$ has a root between $x = 1.5$ and $x = 2$.

2 Solve $x^2 + 2x > 8$.

3 Solve $\cos(x + 0.5) = -0.9$ for $0 \leq x \leq 2\pi$, giving answers to 3 significant figures.

4 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.



5 A particle of mass 3 kg slides from rest down a smooth curved slope, starting 10 m above the bottom.
Take $g = 9.8$ m s^{-2}.
Use energy to find its speed at the bottom of the slope.

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6 The circle C has equation $(x + 3)^2 + (y - 1)^2 = 50$. The point P$(-8, 6)$ lies on C. Find an equation of the tangent to C at P, in the form $ax + by + c = 0$ with integer a, b, c.	
7 Points A, B and C have position vectors $\begin{pmatrix} 2 \\ 2 \\ -2 \end{pmatrix}$, $\begin{pmatrix} 2 \\ 4 \\ -5 \end{pmatrix}$ and $\begin{pmatrix} 2 \\ 6 \\ r \end{pmatrix}$ respectively. Given that A, B, C are collinear, find r.	
8 A car moves in a straight line with constant acceleration. Its final speed is 21 m s^{-1}, its acceleration is 1 m s^{-2} and the motion lasts 7 s. Find the initial speed.	
9 A factory says a proportion 0.4 of its parts are defective. In a sample of 50 parts, 24 are defective. Test, at the 5% significance level, whether the proportion is different from 0.4.	
10 Find the coefficient of x^2 in the expansion of $(4 + 3x)^8$.	