Day 165 **S Tier 10-a-day**

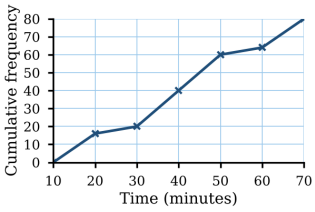
1 The table shows the number of students in each of four groups.
(a) A stratified sample of 23 is taken. Work out how many come from Year 10.
(b) A different stratified sample has 15 from Year 10. Work out the size of this sample.

	Year 7	Year 8	Year 9	Year 10
Number	150	100	200	125

2 The sum of the interior angles of a polygon is 1980°.
Work out the number of sides of the polygon.

3 Here are the first five terms of a quadratic sequence.
−3, 5, 21, 45, 77
Find an expression for the nth term.

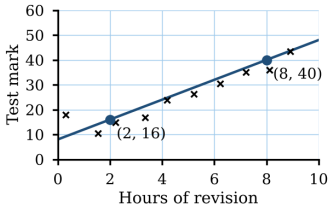
4 The cumulative frequency graph gives information about the times of 80 students to complete a puzzle.
(a) Find an estimate for the median and the interquartile range.
(b) Estimate how many of the 80 had a time greater than 45.



5 Solve $x^2 + 8x - 8 = 0$
Give your answers in the form $a \pm b\sqrt{c}$

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6 The scatter graph shows hours of revision (x) and test mark (y).
The equation of the line of best fit is y = 4x + 8.
(a) Estimate y when x = 7.
(b) Explain why an estimate of y when x = 15 may be unreliable.



7 A church bell rings every 6 minutes.
Another bell rings every 8 minutes.
A third bell rings every 24 minutes.
They all ring together at 7:00 am.
How many times do they all ring together between 7:00 am and 3:00 pm, including both 7:00 am and 3:00 pm if they do?

8 The graph of y = f(x) has a maximum point at (5, 5).
Write down the coordinates of the turning point of the graph of
(a) y = f(x − 1)
(b) y = f(x + 2) − 2

9 Simplify $\frac{1}{4+\sqrt{6}} - \frac{1}{4-\sqrt{6}}$
Give your answer with a rational denominator.

10 ABCD is a rectangle with AB = 13 cm and AD = 13 cm.
A point P inside the rectangle is such that AP ≤ 10 cm and P is nearer to AB than to AD.
Work out the area of the region in which P can lie. Give your answer in terms of π.