Day 121 **S Tier 10-a-day**

1 The table shows the number of students in each of four groups.
(a) A stratified sample of 31 is taken. Work out how many come from Year 7.
(b) A different stratified sample has 14 from Year 7. Work out the size of this sample.

	Year 7	Year 8	Year 9	Year 10
Number	70	30	120	90

2 Make x the subject of $y = \frac{6}{x^2}$
where x is positive.

3 In triangle PQR, side QR is extended to S.
Angle QPR = (4x − 20)°
Angle PQR = (2x + 5)°
Angle PRS = (4x + 35)°
(a) Work out the value of x.
(b) Work out the size of angle PRQ.

4 Priya changes £600 into dollars at £1 = $1.18.
Priya spends $580 and then changes the rest back into pounds at £1 = $1.25.
How many pounds does Priya get back?

5 Find the smallest positive integer k such that 162 × k is a square number.

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6 Triangle P has vertices A(1, −1), B(0, 2) and C(0, 1). Triangle Q has vertices A'(−8, −7), B'(−6, −13) and C'(−6, −11). Q is an enlargement of P. Describe fully the single transformation that maps P onto Q.	
7 (a) Write $x^2 - 4x + 2$ in the form $(x + p)^2 + q$ (b) Write down the coordinates of the turning point of the curve $y = x^2 - 4x + 2$	
8 The equation $2x^2 + 10x + k = 0$ has two different real solutions. Find the range of possible values of k.	
9 The value of a car is decreased by 25%. The new amount is then decreased by 50%. Work out the overall percentage change.	
10 Show that $\sqrt{70 + 30\sqrt{5}} = 5 + 3\sqrt{5}$	