Day 353 **S Tier 10-a-day**

1 The table shows the number of members in each of four groups.
(a) A stratified sample of 29 is taken. Work out how many come from Group B.
(b) A different stratified sample has 30 from Group B. Work out the size of this sample.

	Group A	Group B	Group C	Group D
Number	100	200	80	200

2 In triangle PQR, side QR is extended to S.
Angle QPR = $(4x - 10)°$
Angle PQR = $(3x + 30)°$
Angle PRS = $(6x + 30)°$
(a) Work out the value of x.
(b) Work out the size of angle PRQ.

3 Work out $(2\frac{1}{2} - 2\frac{2}{5}) \times \frac{2}{3}$
Give your answer as a mixed number or a fraction in its simplest form.

4 A sector of a circle has radius 4 cm and angle 72°.
(a) Work out the length of the arc of the sector.
(b) Work out the area of the sector. Give each answer in terms of π.

5 Write $0.9\dot{1}$ as a fraction in its simplest form.

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6 $f(x) = 4x + 5$ and $g(x) = x^2 + 1$ Solve $fg(x) = gf(x)$	
7 Given that $\sqrt{27} - \sqrt{3} = \sqrt{n}$, find the value of n.	
8 A sector of a circle has radius 12 cm and angle 240°. The sector is made into a cone by joining the two straight edges together. (a) Work out the radius of the base of the cone. (b) Work out the exact volume of the cone. Give your answer in terms of π, as a surd if necessary.	
9 T is inversely proportional to the square of n. When n = 4, T = 36. Find the value of T when n = 6.	
10 Show that the equation $x^2 + kx - 5 = 0$ has two distinct real solutions for all values of k.	