Day 324 **S Tier 10-a-day**

1 Solve the simultaneous equations

$x^2 + y^2 = 85$

$y = -3x - 15$

2 The table shows the number of members in each of four groups.

(a) A stratified sample of 22 is taken. Work out how many come from Group C.

(b) A different stratified sample has 6 from Group A. Work out the size of this sample.

	Group A	Group B	Group C	Group D
Number	75	175	175	125

3 Work out $(4.2 \times 10^8) \div (1.5 \times 10^{-8})$

Give your answer in standard form.

4 The ratio of men to women people at a meeting is 5 : 2.

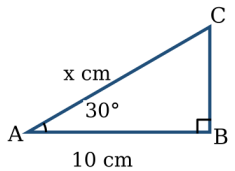
Then $\frac{2}{5}$ of the men and $\frac{1}{3}$ of the women are taken out.

Work out the ratio of men to women now.

5 ABC is a right-angled triangle.

Work out the exact value of x. Give your answer in its simplest form.

The diagram is not drawn accurately.



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6 A price is decreased by 75%. By what percentage must the new value be increased to get back to the original value?	
7 y is directly proportional to the square root of x. When x = 1, y = 3. (a) Find a formula for y in terms of x. (b) Work out the value of y when x = 4.	
8 Simplify fully $\frac{x^2 - 8x + 7}{x + 2} \div \frac{x - 7}{x^2 - 3x - 10}$	
9 OA = $\mathbf{a}$ and OB = $\mathbf{b}$. OP = $-3\mathbf{a} + 4\mathbf{b}$, OQ = $-4\mathbf{a}$ and OR = $-6\mathbf{a} - 8\mathbf{b}$. (a) Show that P, Q and R lie on a straight line. (b) Work out the ratio PQ : QR in its simplest form.	
10 Write $\frac{6 + \sqrt{10}}{7 - \sqrt{10}}$ in the form $p + q\sqrt{10}$ where p and q are rational numbers.	