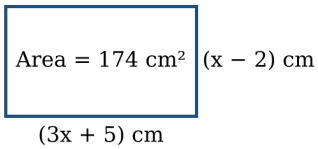
Day 308 **S Tier 10-a-day**

1 The diagram shows a rectangle of length (3x + 5) cm, width (x − 2) cm and area 174 cm^2.
(a) Show that $3x^2 - x - 184 = 0$.
(b) Work out the perimeter of the rectangle.



2 The table shows the number of members in each of four groups.
(a) A stratified sample of 31 is taken. Work out how many come from Group C.
(b) A different stratified sample has 27 from Group C. Work out the size of this sample.

	Group A	Group B	Group C	Group D
Number	160	60	180	220

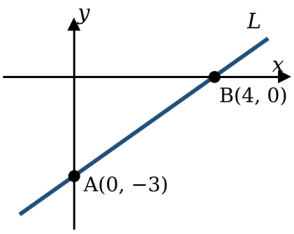
3 Write $\sqrt{24} + \sqrt{96} + \sqrt{6}$ in the form $a\sqrt{6}$ where a is an integer.

4 (a) Write $-9 - 8x - x^2$ in the form $a - (x + b)^2$
(b) Write down the maximum value of $-9 - 8x - x^2$ and the value of x for which it occurs.

5 Two tins are mathematically similar.
The heights of the tins are 4 cm and 10 cm.
The smaller one has volume 80 cm^3.
Work out the volume of the larger one.

Day 308	S Tier 10-a-day

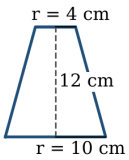
6 The diagram shows the straight line L, which passes through the points A and B.
The line M is perpendicular to L and passes through B.
Find the equation of M in the form y = mx + c.



7 Find the smallest positive integer k such that 4116 × k is a square number.

8 The 2nd term of a geometric sequence is 32.
The 5th term of the sequence is 256.
(a) Work out the common ratio.
(b) Work out the first term.

9 A cone is cut parallel to its base to make a smaller cone and a frustum.
The frustum has height 12 cm, top radius 4 cm and base radius 10 cm.
Work out the volume of the frustum. Give your answer in terms of π.



10 Alloy A holds copper and tin in the ratio 4 : 5.
Alloy B holds copper and tin in the ratio 6 : 6.
18 kg from alloy A is mixed with some of alloy B.
The ratio of copper to tin in the mixture is 16 : 17.
Work out how many kg were taken from alloy B.