Day 333 **S Tier 10-a-day**

1 The lengths of the sides of a right-angled triangle are $(x - 2)$ cm, x cm and $(x + 2)$ cm.
The longest side is $(x + 2)$ cm.
(a) Show that $x^2 - 8x = 0$
(b) Hence work out the area of the triangle.

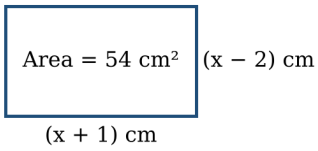
2 A sector of a circle has radius 8 cm and angle 72°.
(a) Work out the length of the arc of the sector.
(b) Work out the area of the sector. Give each answer in terms of π.

3 Expand and simplify $(1 + \sqrt{3})(4 + \sqrt{3})$
Give your answer in the form $p + q\sqrt{3}$

4 Two shapes are mathematically similar.
The smaller has height 18 cm and area 36 cm^2.
The larger has area 81 cm^2.
Work out the height of the larger shape.

5 The table gives information about the times of some people.
Work out an estimate for the mean time.
Give your answer correct to 1 decimal place.
(Calculator)

Time, t (minutes)	Frequency density
$10 < t \leq 20$	2
$20 < t \leq 30$	0.4
$30 < t \leq 50$	0.3
$50 < t \leq 70$	0.4

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6 f(x) = 4x + 1 and g(x) = x^2 Solve fg(x) = gf(x)	
7 The diagram shows a rectangle of length (x + 1) cm, width (x − 2) cm and area 54 cm^2. (a) Show that $x^2 - x - 56 = 0$. (b) Work out the perimeter of the rectangle. 	
8 In a fruit box, the ratio of the number of apples to the number of pears is 2 : 7. Then 2 more apples are added and 6 pears are removed. The ratio is now 1 : 3. How many pears were there at the start?	
9 Find the smallest positive integer k such that 168 × k is a cube number.	
10 y is directly proportional to the square of x and inversely proportional to z. When x = 6 and z = 2, y = 108. Work out the value of y when x = 6 and z = 4.	