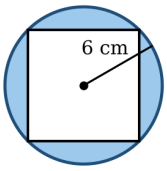
Day 69	S Tier 10-a-day

1 A sector of a circle has angle 120° and area 27π cm^2.
(a) Work out the radius of the circle.
(b) Work out the length of the arc of the sector.
Give your answer to (b) in terms of π.

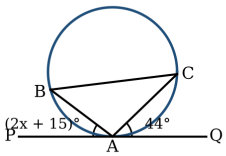
2 A red light flashes every 6 minutes.
A blue light flashes every 15 minutes.
A green light flashes every 18 minutes.
They all flash together at 8:00 am.
How many times do they all flash together between 8:00 am and 3:00 pm, including both 8:00 am and 3:00 pm if they do?

3 The diagram shows a square inside a circle of radius 6 cm.
The four vertices of the square lie on the circle.
Work out the area of the shaded region. Give your answer in terms of π.



4 y is directly proportional to the cube of x.
When x = 1, y = 5.
(a) Find a formula for y in terms of x.
(b) Work out the positive value of x when y = 40.

5 PAQ is a tangent to the circle at A. B and C are points on the circle. Angle PAB = (2x + 15)°, angle ACB = (3x + 4)° and angle CAQ = 44°.
(a) Work out the value of x.
(b) Work out the size of angle BAC.
The diagram is not drawn accurately.

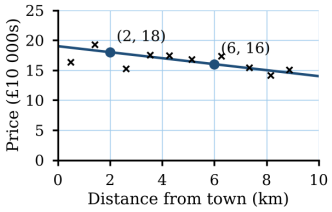


Day 69 **S Tier 10-a-day**

6 Write $\frac{14}{2+\sqrt{5}}$ in the form $p + q\sqrt{5}$ where p and q are integers.

7 Simplify fully $\frac{x^2 - 9}{x^2 - 6x} \div \frac{x^2 - 7x + 12}{x}$

8 The scatter graph shows distance from town (x) and price (y).
The line of best fit passes through (2, 18) and (6, 16).
(a) Find its equation in the form y = mx + c.
(b) Explain what its gradient tells you.



9 Show that the line y = 3x + 10 is a tangent to the circle $x^2 + y^2 = 10$.
Find the coordinates of the point where the line touches the circle.

10 F is directly proportional to m and inversely proportional to the square of d.
When m = 5 and d = 1, F = 5.
Work out the value of F when m = 3 and d = 1.