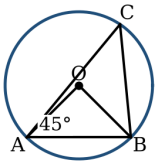
Day 72	S Tier 10-a-day

1 A is the point $(-2, -3)$ and B is the point $(6, -9)$.
Find an equation of the perpendicular bisector of AB.
Give your answer in the form ax + by = c, where a, b and c are integers.

2 A stone block in the shape of a cuboid weighs 420 N.
Its smallest face has area 300 cm^2. Its largest face has area 600 cm^2.
Pressure = force ÷ area
Work out (a) the greatest pressure and (b) the least pressure the stone block can exert on the ground, in N/m^2.

3 A, B and C are points on a circle, centre O.
Angle OAB = 45°.
(a) Work out the size of angle AOB.
(b) Work out the size of angle ACB.
The diagram is not drawn accurately.



4 y is directly proportional to the square of x.
When x = 3, y = 45.
(a) Find a formula for y in terms of x.
(b) Work out the value of y when x = 5.

5 The diagram shows a running track made from a rectangle and two semicircles.
(a) Work out the total length of the boundary of the track.
(b) Work out the area enclosed by the track.
Give your answers in terms of π.
The diagram is not drawn accurately.



Day 72	S Tier 10-a-day

6 Uma spent $\frac{5}{8}$ of her money on a coat.

She then spent $\frac{1}{6}$ of the money that was left on a bag.

She then had £150 left.

How much money did Uma have to start with?

7 The lengths of the sides of a right-angled triangle are $(x - 4)$ cm, $(x + 3)$ cm and $(x + 4)$ cm.

The longest side is $(x + 4)$ cm.

(a) Show that $x^2 - 10x + 9 = 0$

(b) Hence work out the area of the triangle.

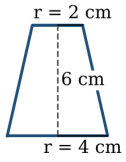
8 $f(x) = -3x - 1$ and $g(x) = x^2 - 2$

Solve $fg(x) = gf(x)$

9 A cone is cut parallel to its base to make a smaller cone and a frustum.

The frustum has height 6 cm, top radius 2 cm and base radius 4 cm.

Work out the volume of the frustum. Give your answer in terms of π.



10 Simplify $\frac{1}{7 + \sqrt{7}} + \frac{1}{7 - \sqrt{7}}$

Give your answer with a rational denominator.