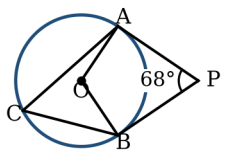
Day 111 **S Tier 10-a-day**

1 The table gives information about the masses of some eggs.
An estimate for the mean is 23.
Work out the value of x.

Mass, m (g)	Frequency
$0 < m \leq 10$	4
$10 < m \leq 20$	x
$20 < m \leq 30$	10
$30 < m \leq 40$	7

2 Make l the subject of $T = 5\sqrt{l - 3} + 3$

3 PA and PB are tangents to a circle, centre O. C is a point on the circle. Angle APB = 68°.
(a) Work out the size of angle AOB.
(b) Work out the size of angle ACB.
The diagram is not drawn accurately.

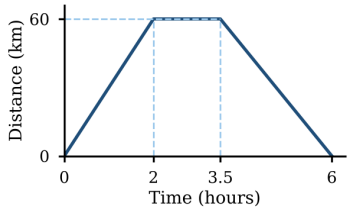


4 60 beetles in a field are caught, marked and put back.
Later, a second sample of 80 beetles is caught. 8 of these are marked.
(a) Work out an estimate for the number of beetles in a field.
(b) State one assumption you have made.

5 Show that $(5 + 3\sqrt{10})(5 - 3\sqrt{10})$ is an integer.

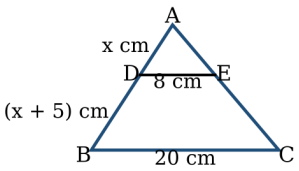
Day 111 **S Tier 10-a-day**

6 The graph shows Callum's cycle ride to a café and back.
(a) Work out Callum's speed on the way back.
(b) Work out Callum's average speed for the whole ride, including the stop.



7 P is inversely proportional to the square of t.
When t = 2, P = 1.
(a) Find a formula for P in terms of t.
(b) Find the value of P when t = 1.

8 In the diagram, DE is parallel to BC.
AD = x cm, DB = (x + 5) cm, DE = 8 cm and BC = 20 cm.
(a) Find the value of x.
(b) Work out the length of AB.
The diagram is not drawn accurately.



9 The line $y = -x + k$ is a tangent to the circle $x^2 + y^2 = 22$.
Find the possible values of k.
Give any surds in their simplest form.

10 Write $\frac{5+\sqrt{7}}{3-\sqrt{7}}$ in the form $p + q\sqrt{7}$
where p and q are rational numbers.