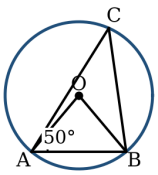
Day 95 **S Tier 10-a-day**

1 A, B and C are points on a circle, centre O.
Angle OAB = 50°.
(a) Work out the size of angle AOB.
(b) Work out the size of angle ACB.
The diagram is not drawn accurately.



2 100 fish in a lake are caught, tagged and put back.
Later, a second sample of 120 fish is caught. 4 of these are tagged.
(a) Work out an estimate for the number of fish in a lake.
(b) State one assumption you have made.

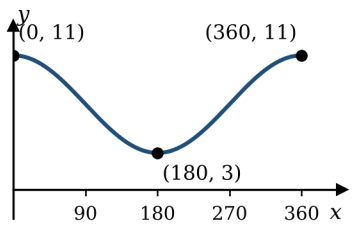
3 Expand and simplify $(x - 5)(x + 2)(x + 6)$

4 The graph of $y = f(x)$ has a maximum point at $(3, -5)$.
Write down the coordinates of the turning point of the graph of
(a) $y = f(x) + 3$
(b) $y = f(x + 1) - 2$

5 Here are six numbers.
$\frac{1}{\sqrt{3}}, \sqrt{2} \times \sqrt{6}, \frac{\sqrt{18}}{\sqrt{2}}, \frac{\sqrt{20}}{\sqrt{5}}, (1 + \sqrt{2})^2, \sqrt{2} + \sqrt{8}$
Write down the rational numbers.

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6 The diagram shows the graph of $y = a \cos x° + c$ for $0 \leq x \leq 360$.
Some points on the graph are labelled.
Find the value of a and the value of c.



7 The value of a house increases by 20% each year.
After 4 years it is worth £40,435.20.
Work out its value 4 years ago. (Calculator)

8 A point A is on level ground in line with the base of a cliff. (Calculator)
The angle of elevation of the top of the cliff from A is 46°.
B is a point on the same line, 60 m further from the cliff than A.
The angle of elevation of the top of the cliff from B is 37°.
Work out the height of the cliff. Give your answer to 1 decimal place.

9 A shop mixes two types of mixed nuts.
Type A costs £9.00 per kg and type B costs £12.00 per kg.
They are mixed in the ratio A : B = 2 : 4.
The mixture is sold for £13.20 per kg.
Work out the percentage profit.

10 Show that $3^{n+3} + 3^n$ is always a multiple of 28.