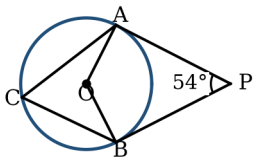
Day 8 **S Tier 10-a-day**

1 PA and PB are tangents to a circle, centre O. C is a point on the circle. Angle APB = 54°.
(a) Work out the size of angle AOB.
(b) Work out the size of angle ACB.
The diagram is not drawn accurately.



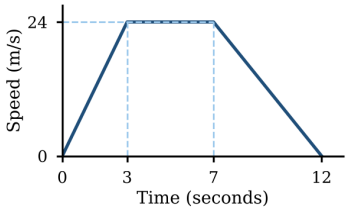
2 Simplify fully $\frac{9x^4y \times 2xy}{2x^2y^3}$

Give your answer in the form kx^ay^b

3 In triangle PQR, side QR is extended to S.
Angle QPR = (2x)°
Angle PQR = (3x + 30)°
Angle PRS = (4x + 57)°
(a) Work out the value of x.
(b) Work out the size of angle PRQ.

4 The 4-digit number 656k is a multiple of 9.
k is a single digit.
Find all the possible values of k.

5 The graph shows the speed of a cyclist during 12 seconds.
(a) Work out the acceleration during the first 3 seconds.
(b) Work out the average speed over the whole 12 seconds.



Day 8	S Tier 10-a-day
6 Expand and simplify $(3 - \sqrt{7})(2 + 2\sqrt{7})$ Give your answer in the form $p + q\sqrt{7}$	
7 A fair 6-sided dice and a spinner numbered 1 to 5 are each thrown once. The first score and the second score are recorded. (a) Work out the probability that the product is even. (b) Given that the first number is greater than the second, work out the probability that the product is even.	
8 Write $8^3 \times 12^3$ as a product of powers of prime numbers.	
9 A point A is on level ground in line with the base of a lighthouse. (Calculator) The angle of elevation of the top of the lighthouse from A is 37°. B is a point on the same line, 30 m further from the lighthouse than A. The angle of elevation of the top of the lighthouse from B is 21°. Work out the height of the lighthouse. Give your answer to 1 decimal place.	
10 The line $y = 3x + k$ is a tangent to the circle $x^2 + y^2 = 15$. Find the possible values of k. Give any surds in their simplest form.	