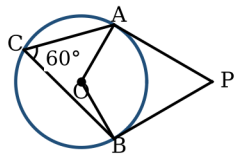
Day 88	IGCSE 10-a-day
1 Write $\frac{3^{n-2} \times 9^n}{9^n}$ in the form 3^{an+c} where a and c are integers.	
2 Solve $4x^2 - 4x = 15$	
3 A curve has equation $y = x^3 + 3x^2 - 9x + 4$. Find the coordinates of the turning points of the curve. Use the second derivative to determine whether each is a maximum or a minimum.	
4 PA and PB are tangents to a circle, centre O. C is a point on the circle. Angle ACB = 60°. (a) Work out the size of angle AOB. (b) Work out the size of angle APB. The diagram is not drawn accurately. 	
5 $V = ab^n$, where a and b are positive constants. When n = 2, V = 324. When n = 4, V = 262.44. Find the values of a and b, and the value of V when n = 5.	

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6 A particle P moves in a straight line. After t seconds, its displacement from a fixed point O is s metres, where $s = 2t^3 - 18t^2 + 30t + 1$ $(t \geq 0)$ Find the distance between the two positions where P is at rest.	
7 Write $9^2 \times 18^2$ as a product of powers of prime numbers.	
8 $g(x) = x^2 - 4x + 2$ for $x \leq 2$. (a) Find the range of g. (b) Find $g^{-1}(x)$.	
9 Zane and Oscar play a match. The first to win 2 tennis sets wins the match. The probability that Zane wins any one of the tennis sets is $\frac{4}{5}$. Work out the probability that Zane wins the match.	
10 $f(x) = x^3 + kx^2 + 12x + 6$, where k is a constant. Given that f is an increasing function for all values of x, find the range of possible values of k.	