Day 101	IGCSE 10-a-day
1 $f(x) = 5x + 8$ and $g(x) = x^2 + 7$. Work out $ff(-2) + gf(-2)$.	
2 $y = x^3 - 6x^2 + 5x + 2$ (a) Find $\frac{d^2y}{dx^2}$. (b) Find the value of x for which $\frac{d^2y}{dx^2} = 0$, and work out the gradient of the curve at this value of x.	
3 ξ = integers from 1 to 20 A = the numbers greater than 10 B = the square numbers (a) List the elements of $A \cap B'$. (b) Find $n(A \cup B)$.	
4 9 machines can make a batch of bolts in 10 hours. After 4 hours, 6 of the machines leave. The rest carry on working at the same rate. How many more hours does it take to finish?	
5 The curve $y = -x^2 + 2x + 2$ crosses the y-axis at the point A. The tangent to the curve at A meets the x-axis at B. Find the coordinates of B.	

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6 A retailer buys a printer for £230. It adds a 30% mark-up to get the selling price. In a sale the selling price is reduced by 20%. Work out the percentage profit or loss on the original cost.	
7 Simplify fully $\frac{x^2 - 12x + 35}{x^2 - 4x} \times \frac{x^2 + 2x}{x - 5}$	
8 OA = $\mathbf{a}$ and OB = $\mathbf{b}$. OP = $-\mathbf{a} + 4\mathbf{b}$, OQ = $-2\mathbf{a} + 6\mathbf{b}$ and OR = $-4\mathbf{a} + 10\mathbf{b}$. (a) Show that P, Q and R lie on a straight line. (b) Work out the ratio PQ : QR in its simplest form.	
9 The curve C has equation $y = x^2 + 5x - 3$. The points A and B on C have x coordinates -2 and 2. The tangents to C at A and at B meet at the point T. Find the coordinates of T.	
10 PA and PB are tangents to a circle, centre O. C is a point on the circle. Angle ACB = 62°. (a) Work out the size of angle AOB. (b) Work out the size of angle APB. The diagram is not drawn accurately. 	