Day 203	IGCSE 10-a-day
1 Here are 11 numbers. 55, 21, 16, 6, 27, 18, 17, 37, 36, 49, 11 Find (a) the median (b) the interquartile range.	
2 A bag contains 2 red beads, 5 blue beads and 2 green beads. Two beads are taken at random without replacement. Work out the probability that (a) they are different colours, (b) at least one is red.	
3 Simplify fully $\frac{x^2 + 13x + 42}{x^2 - 5x} \times \frac{x^2 + x}{x + 6}$	
4 A curve has equation $y = -x^2 - \frac{5}{x}$. Find the equation of the tangent to the curve at the point where $x = 4$.	
5 $\mathbf{OA} = 3\mathbf{a}$, $\mathbf{OB} = -\mathbf{a} + 4\mathbf{b}$ and $\mathbf{OC} = 5\mathbf{a} - 2\mathbf{b}$. Show that A, B and C lie on a straight line.	

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6 A curve has equation $y = -2x^3 + 12x^2 - 18x + 2$. The point A $(-1, k)$ lies on the curve. Work out the value of k and the gradient of the curve at A.	
7 Solve $x - 5\sqrt{x} + 6 = 0$	
8 A circle has equation $x^2 + y^2 = 169$. The point P$(5, -12)$ lies on the circle. (a) Find the equation of the tangent to the circle at P. Give your answer in the form $ax + by = c$, where a, b and c are integers. (b) The tangent meets the x-axis at the point T. Write down the coordinates of T.	
9 Write $\frac{1+\sqrt{5}}{3+\sqrt{5}}$ in the form $p + q\sqrt{5}$ where p and q are rational numbers.	
10 An open box has a square base of side x cm and height h cm. The total outside surface area is 12 cm^2. (a) Show that the volume of the box is $V = \frac{1}{4}(12x - x^3)$ cm^3. (b) Find the maximum volume of the box, proving that it is a maximum.	