Day 179	IGCSE 10-a-day
1 Simplify fully $3\sqrt{20} \times 2\sqrt{12}$	
2 Differentiate $-3x^2 + 4x + \frac{2}{x}$ with respect to x.	
3 The value of a machine falls by 10% each year. After 3 years it is worth £3,645. Work out its value at the start. (Calculator)	
4 A wooden block in the shape of a cuboid weighs 900 N. Its smallest face has area 200 cm^2. Its largest face has area 250 cm^2. Pressure = force ÷ area Work out (a) the greatest pressure and (b) the least pressure the wooden block can exert on the ground, in N/m^2.	
5 In triangle PQR, PQ = 19 cm and angle PQR = 60°. The area of the triangle is $\frac{133\sqrt{3}}{2}$ cm^2. Work out the length of QR. Do not use a calculator.	

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6 £2,500 is invested at 10% per year compound interest. Work out the least whole number of years after which the investment is worth more than £7,500. (Calculator)	
7 Simplify $(25x^4y^4)^{\frac{3}{2}}$	
8 A particle moves in a straight line. After t seconds its displacement from a fixed point is s metres, where $s = 2t^3 - 18t^2 + 55t - 1$ (a) Show that the particle is never at rest. (b) Find the least speed of the particle and the time it occurs.	
9 $f(x) = \frac{-x+3}{2x+1}$ where $x \neq -\frac{1}{2}$ (a) Show that ff(x) = x. (b) Write down $f^{-1}(x)$.	
10 A storage unit is a cuboid with a square base of side x metres and height h metres, and has an open top. Its volume is 32 m^3. (a) Show that the total outside surface area, A m^2, is $A = x^2 + \frac{128}{x}$. (b) Find the minimum possible value of A, showing that it is a minimum.	