Day 100	S Tier 10-a-day
1 A flight leaves London at 11:05 (London time). It takes 12 hours 35 minutes. When it is 12:00 in London it is 21:00 in Sydney. At what time, in Sydney time, does the flight land? Say if it is on a different day.	
2 Amir invests £8,000 for 3 years at 4% per year compound interest. Work out the value of the investment at the end of the 3 years. Give your answer to the nearest penny. (Calculator)	
3 Write $\sqrt{80} - \sqrt{45} + \sqrt{20}$ in the form $a\sqrt{5}$ where a is an integer.	
4 Solve $3^{2x} = \frac{1}{9}$	
5 The ratio of blue to green sweets in a tin is 7 : 9. Then $\frac{2}{5}$ of the blue and $\frac{1}{3}$ of the green are taken out. Work out the ratio of blue to green now.	

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6 Work out $16^{\frac{5}{4}}$	
7 The point P(6, 3) is reflected in the y-axis. The image is then rotated 90° clockwise about the origin. (a) Write down the coordinates of the final image of P. (b) Describe fully the single transformation that is equivalent to these two transformations.	
8 OA = $\mathbf{a}$ and OB = $\mathbf{b}$. OP = $4\mathbf{a} + 5\mathbf{b}$, OQ = $-2\mathbf{a} + 20\mathbf{b}$ and OR = $-6\mathbf{a} + 30\mathbf{b}$. (a) Show that P, Q and R lie on a straight line. (b) Work out the ratio PQ : QR in its simplest form.	
9 Factorise fully $4x^3 - 16x$	
10 A cone is cut parallel to its base to make a smaller cone and a frustum. The frustum has height 9 cm, top radius 4 cm and base radius 8 cm. Work out the volume of the frustum. Give your answer in terms of π. 	