Day 285	S Tier 10-a-day
1 A sector of a circle has angle 216° and area $\frac{48}{5}\pi$ cm^2. (a) Work out the radius of the circle. (b) Work out the length of the arc of the sector. Give your answer to (b) in terms of π.	
2 Without using a calculator, work out $0.\dot{9}\dot{1} \times 0.66\dot{3}$ Give your answer as a fraction in its simplest form.	
3 The point P(−4, 1) is reflected in the line $y = -x$. The image is then reflected in the line $y = x$. (a) Write down the coordinates of the final image of P. (b) Describe fully the single transformation that is equivalent to these two transformations.	
4 Use the iteration formula $x_{n+1} = \sqrt{2x_n + 5}$ with $x_0 = 2$ (Calculator) to work out x_1, x_2 and x_3. Give each answer correct to 3 decimal places.	
5 An alloy is made by mixing 60 cm^3 of tin with 40 cm^3 of zinc. The density of tin is 7.3 g/cm^3. The density of zinc is 7.1 g/cm^3. Work out the density of the alloy.	

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6 Work out $27^{-\frac{5}{3}}$	
7 $f(x) = 4x - 5$ and $g(x) = x^2 - 1$ Solve $fg(x) = gf(x)$	
8 Machine A makes 40% of the bolts in a factory. Machine B makes the rest. 30% of the bolts from machine A are faulty. 40% of the bolts from machine B are faulty. (a) Work out the probability that a bolt chosen at random is faulty. (b) A faulty bolt is found. Work out the probability that it was made by machine A.	
9 A circle has equation $(x + 4)^2 + (y + 3)^2 = 100$. The point P(2, 5) lies on the circle. Find an 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.	
10 $a = 0.166$ and $b = 82.4$, both correct to 3 significant figures. Work out $a \times b$. Write down your answer to a suitable degree of accuracy. You must show your working and give a reason for your answer. (Calculator)	