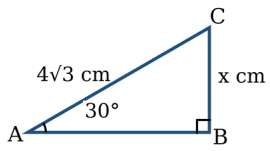
Day 257	S Tier 10-a-day
1 The 4-digit number 737k is a multiple of 8. k is a single digit. Find all the possible values of k.	
2 The mean of 8 numbers is 98. One number is removed and the mean of the remaining 7 numbers is 106. Work out the number that was removed.	
3 $\mathbf{a} = \begin{pmatrix} 0 \\ -4 \end{pmatrix}$, $\mathbf{b} = \begin{pmatrix} 0 \\ 2 \end{pmatrix}$ and $\mathbf{c} = \begin{pmatrix} 3 \\ -2 \end{pmatrix}$ $\mathbf{a} + k\mathbf{b}$ is parallel to $\mathbf{c}$. Work out the value of k.	
4 In a group of members, 35% are juniors and the rest are seniors. 15% of the juniors and 30% of the seniors play chess. What percentage of all the members play chess?	
5 A metal pipe is a hollow cylinder of length 50 cm. (Calculator) The outer radius is 4 cm and the inner radius is 2 cm. The density of the metal is 11.3 g/cm^3. Work out the mass of the pipe. Give your answer in kilograms correct to 3 significant figures.	

Day 257	S Tier 10-a-day
6 In a club, the ratio of the number of boys to the number of girls is 2 : 7. Then 3 more boys are added and 16 girls are removed. The ratio is now 11 : 12. How many boys were there at the start?	
7 $f(x) = 3x + 1$ and $g(x) = x^2$ Solve $fg(x) = gf(x)$	
8 T is directly proportional to the cube of l. When l = 5, T = 1000. (a) Find a formula for T in terms of l. (b) Find the value of T when l = 6.	
9 ABC is a right-angled triangle. Work out the exact value of x. Give your answer in its simplest form. The diagram is not drawn accurately. 	
10 In a population of 10,000 people, 4% have a certain disease. A test gives a positive result for 80% of people who have the disease and for 2% of people who do not. A person is chosen at random and tests positive. Work out the probability that they have the disease.	