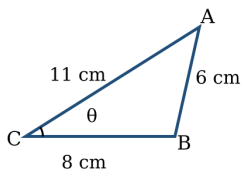
Day 221	IGCSE 10-a-day
1 The 4-digit number 55k2 is a multiple of 9. k is a single digit. Find all the possible values of k.	
2 $y = (x - 3)(x + 3)$ Find $\frac{dy}{dx}$.	
3 (a) Write $x^2 - 8x + 12$ in the form $(x + p)^2 + q$ (b) Write down the coordinates of the turning point of the curve $y = x^2 - 8x + 12$	
4 A shop mixes two types of coffee. Type A costs £8.00 per kg and type B costs £5.00 per kg. They are mixed in the ratio A : B = 5 : 1. The mixture is sold for £9.75 per kg. Work out the percentage profit.	
5 The diagram shows triangle ABC. (Calculator) (a) Work out angle ACB, marked θ, to 1 decimal place. (b) Work out the area of triangle ABC to 3 significant figures. The diagram is not drawn accurately. 	

Day 221	IGCSE 10-a-day
6 A bag contains 4 orange beads, 4 purple beads and 1 pink bead. Two beads are taken at random without replacement. Work out the probability that (a) at least one is orange, (b) exactly one is orange.	
7 The number of fish in a lake, N, after t months is modelled by $N = -t^3 + 15t^2 + 7t + 1000$ for $0 \leq t \leq 20$ Find the time at which N is increasing most rapidly, and the rate of increase at this time.	
8 78 pupils were asked which activities they do. A: play football B: play netball C: play rugby $n(A) = 52$, $n(B) = 46$, $n(C) = 38$, $n(A \cap B) = 28$, $n(A \cap C) = 24$, $n(B \cap C) = 22$, $n(A \cap B \cap C) = 14$. (a) Work out how many are in none of A, B and C. (b) Work out how many are in exactly one of A, B and C.	
9 The curves $y = -x^2 + 5x - 2$ and $y = -3x^2 + x - 4$ touch at one point. Find the coordinates of this point and the equation of the common tangent.	
10 A ship sails 15 km from P to Q on a bearing of 050°. It then sails 6 km from Q to R on a bearing of 151°. (a) Work out PR (3 s.f.). (b) Work out the bearing of R from P (nearest degree). (Calculator) 