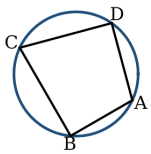
Day 209	S Tier 10-a-day
1 20 fish in a lake are caught, tagged and put back. Later, a second sample of 100 fish is caught. 8 of these are tagged. (a) Work out an estimate for the number of fish in a lake. (b) State one assumption you have made.	
2 Factorise $8x^2 + 10x + 3$	
3 A, B, C and D are points on a circle. Angle DAB = (3x + 20)°, angle BCD = (2x + 25)° and angle ABC = (2x + 5)°. (a) Work out the value of x. (b) Work out the size of angle ADC. The diagram is not drawn accurately. 	
4 L is directly proportional to the cube of t. When t = 5, L = 375. (a) Find a formula for L in terms of t. (b) Work out the positive value of t when L = 24.	
5 Nia invests £3,000 for 4 years at 2% per year simple interest. Kofi invests £3,000 for 4 years at 2% per year compound interest. Work out how much more interest Kofi earns than Nia. Give your answer to the nearest penny. (Calculator)	

Day 209	S Tier 10-a-day
6 The lengths of the sides of a right-angled triangle are $(x - 8)$ cm, $(x - 9)$ cm and $(x - 7)$ cm. The longest side is $(x - 7)$ cm. (a) Show that $x^2 - 20x + 96 = 0$ (b) Hence work out the area of the triangle.	
7 x is an acute angle and $\cos x = \frac{1}{13}$. (a) Find the exact value of sin x. (b) Find the exact value of tan x. Give each answer as a fraction or a surd. Do not use a calculator.	
8 A shop mixes two types of tea. Type A costs £7.00 per kg and type B costs £4.00 per kg. They are mixed in the ratio A : B = 4 : 1. The mixture is sold for £8.96 per kg. Work out the percentage profit.	
9 $N = 2^5 \times 3 \times 5$ How many of the factors of N are even numbers?	
10 (a) Show that the equation $x^2 - x - 4 = 0$ can be rearranged to give $x = 1 + \frac{4}{x}$ (Calculator) (b) Use the iteration formula $x_{n+1} = 1 + \frac{4}{x_n}$ with $x_0 = 2$ to work out x_1 and x_2. Give each answer correct to 3 decimal places.	