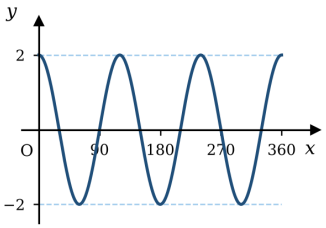
Day 287	S Tier 10-a-day
1 Work out the value of $(p - q)^2 - (p + q)^2$ when $p = -1$, $q = 3$ and $r = 2$.	
2 In triangle PQR, side QR is extended to S. Angle QPR = $(3x + 30)°$ Angle PQR = $(3x + 10)°$ Angle PRS = $(5x + 55)°$ (a) Work out the value of x. (b) Work out the size of angle PRQ.	
3 The 2nd term of an arithmetic sequence is 16. The 5th term of the sequence is 43. (a) Find an expression for the nth term of the sequence. (b) Is 160 a term of the sequence? You must show your working.	
4 9 machines can make a batch of bolts in 12 hours. After 4 hours, 3 of the machines leave. The rest carry on working at the same rate. How many more hours does it take to finish?	
5 Given that $\frac{27^5 \times 3^3}{27^2} = 3^n$, find the value of n.	

Day 287	S Tier 10-a-day
6 The diagram shows the graph of y = a cos bx, where a and b are positive integers. (a) Write down the value of a and the value of b. (b) Work out the value of y when x = 340°. 	
7 Dina invests £4,000 in an account paying compound interest. The interest rate is the same percentage each year. After 3 years the account holds £5,324. Work out the annual percentage interest rate.	
8 A factory makes 6.6×10^3 bottles each day. It runs for 5×10^3 days. How many bottles does it make? Give your answer in standard form.	
9 F is directly proportional to m and inversely proportional to the square of d. When m = 6 and d = 3, F = 2. Work out the value of F when m = 1 and d = 1.	
10 ABCD is a rectangle with AB = 6 cm and AD = 9 cm. A point P inside the rectangle is such that AP ≤ 6 cm and P is nearer to A than to B. Work out the area of the region in which P can lie. Give your answer in terms of π and surds.	