Day 291	A Level Maths: C Tier 10-a-day
1 Simplify $\frac{1 - \cos^2 x}{\sin x}$.	
2 Sketch $y = (x + 5)(x + 1)(x - 2)$. Write down the coordinates of the points where the curve meets the axes.	
3 Car P passes a point O at constant speed 10 m s^{-1}. At that instant car Q starts from rest at O with constant acceleration 2 m s^{-2} in the same direction. Find the time when Q catches up P.	
4 Here are 7 values: 10, 16, 20, 10, 3, 14, 9 Find the mean and the standard deviation, to 3 s.f.	
5 A rope pulls a box with a force of 40 N at an angle of 30° above the horizontal. Find the horizontal and vertical components of the force, to 3 s.f.	

Day 291	A Level Maths: C Tier 10-a-day
6 $f(x) = e^x - 1x - 3$. Show that $f(x) = 0$ has a root between $x = 1$ and $x = 2$.	
7 Expand $(1 - 3x)^{\frac{1}{3}}$ in ascending powers of x up to and including the term in x^2. State the range of values of x for which the expansion is valid.	
8 For a data set $Q_1 = 13$ and $Q_3 = 37$. A value is an outlier if it is more than 1.5 × IQR above Q_3 or below Q_1. Determine whether 34 and −27 are outliers.	
9 Find the sum of the first 16 terms of the series $3 + 9 + 15 + 21 + ...$	
10 A sector has radius 10 cm and area 25.0 cm^2. Find the angle of the sector in radians and the arc length.	