Day 350	A Level Maths: B Tier 10-a-day
1 A sector of a circle has radius 5 cm and angle 30°. Find, in terms of π, the arc length and the area of the sector.	
2 Solve $-2 < -3x - 4 < 10$.	
3 A box of mass 10 kg rests on a rough horizontal floor, with coefficient of friction 0.5. A horizontal force of 39 N is applied to the box. Take $g = 9.8$ m s^{-2}. Determine whether the box moves. Find the friction force, or the acceleration if it moves.	
4 Given that $\tan\theta = \frac{24}{7}$ and $0 < \theta < 90°$, find the exact value of $\sin 2\theta$.	
5 A is the point (3, 2) and B is the point (4, 7). Find the perpendicular bisector of AB as $ax + by + c = 0$, with integer a, b, c.	

Day 350	A Level Maths: B Tier 10-a-day
6 A sledge of mass 6 kg is pulled across smooth horizontal ice by a rope with tension 30 N, inclined at α above the horizontal, where $\tan\alpha = \frac{3}{4}$. Take $g = 9.8$ m s^{-2}. Find (a) the acceleration of the sledge, (b) the normal reaction of the ice.	
7 Line l_1 has equation $7x + 8y = 42$ and line l_2 has equation $7x + 3y = 7$. The lines meet at P. Find the area of the triangle formed by l_1, l_2 and the x-axis.	
8 Ordered data, texts sent in a day by 11 students: 15, 16, 20, 20, 21, 24, 31, 36, 38, 40, 69. Find Q_1, Q_3, the IQR and any outliers (more than 1.5 × IQR beyond a quartile).	
9 The depth of water at a pier is modelled by $D = 8 + 4\sin(\frac{\pi t}{6})$, where t is in hours after noon. Find (a) the greatest and least values, (b) the values of t with $0 \leq t \leq 12$ when it equals 6 m.	
10 Large data set: mean pressure (hPa) at Camborne has mean 1014, sd 5. Outliers are more than 2 sd from the mean. Are the values 1021 and 1006 outliers?	