Day 131	A Level Maths: B Tier 10-a-day
1 X ~ B(15, 0.4). Find, to 3 significant figures, (a) P(X = 7) (b) P(X ≤ 7)	
2 The points A and B have coordinates (1, 4) and (8, 5). (a) Find the midpoint of AB. (b) Find the line AB as ax + by + c = 0, with integer a, b, c.	
3 Given that $y = e^x \cos x$, find $\frac{dy}{dx}$, and its value when $x = \frac{\pi}{2}$.	
4 Customers arrive at a shop at random at an average rate of 8 per hour. Find the probability that in 30 minutes there are exactly 1 (3 s.f.).	
5 Find the coefficient of x^4 in the expansion of $(3 + x)^6$.	

Day 131	A Level Maths: B Tier 10-a-day
6 A particle of mass 4 kg is acted on by forces $(-4\mathbf{i} - 5\mathbf{j})$ N and $\mathbf{P}$ N only. Its acceleration is $(2\mathbf{j})$ m s^{-2}. Find $\mathbf{P}$, and its magnitude to 3 significant figures.	
7 Solve $\frac{dy}{dx} = \frac{5y}{x}$ for $x > 0$, given that $y = 4$ when $x = 1$.	
8 The line $12x - 5y = k$ is a tangent to the circle $(x - 3)^2 + (y - 3)^2 = 169$. Find the two possible values of k.	
9 A sledge of mass 10 kg is pulled across smooth horizontal ice by a rope with tension 26 N, inclined at α above the horizontal, where $\tan\alpha = \frac{12}{5}$. Take g = 9.8 m s^{-2}. Find (a) the acceleration of the sledge, (b) the normal reaction of the ice.	
10 A sector of a circle has radius 12 cm and area 54π cm^2. Find the angle of the sector in degrees.	