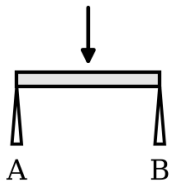
Day 261	A Level Maths: C Tier 10-a-day
1 The velocity of a particle is $(8\mathbf{i} + 15\mathbf{j})$ m s^{-1}, where $\mathbf{i}$ and $\mathbf{j}$ are perpendicular unit vectors. (a) Find the speed. (b) Find the acute angle between the direction of motion and the line of $\mathbf{i}$. Give 1 d.p.	
2 The discrete random variable X has this distribution. x: 5, 6, 7, 8 P(X = x): 0.3, 0.3, 0.2, 0.2 Find E(X) and Var(X).	
3 The point P(−5, 4) lies on the curve y = f(x). Write down the coordinates of the image of P on (a) y = f(x) + 1 (b) y = 3f(x)	
4 X is the number of sixes when a fair die is rolled 19 times. Can X be modelled by a binomial distribution? Give a reason.	
5 Write down the exact values of (a) sec 150° (b) cot 135°	

Day 261	A Level Maths: C Tier 10-a-day
6 A uniform beam AB of mass 10 kg and length 2 m rests horizontally on supports at A and B. A load of mass 25 kg is placed on the beam 1 m from A. Take g = 9.8 m s^{-2}. Find the reaction at B.  	
7 The circle $x^2 + (y - 1)^2 = 169$ passes through P(12, −4). Find the gradient of the tangent to the circle at P.	
8 Use the substitution $u = x^2 + 3$ to find $\int 6x(x^2 + 3)^3 \, dx$.	
9 Solve the simultaneous equations: $y = x^2 - 2x + 8$, $y = 2x + 5$.	
10 The curve $y = 6x - x^2$ and the line $y = 3x$ meet at the origin and at P. Find the area enclosed between them.	