Day 352	A Level Maths: B Tier 10-a-day
1 P(A) = 0.4, P(B) = 0.6, P(A ∩ B) = 0.09. Find (a) P(A ∪ B), (b) P(A | B). (c) Are A and B independent?	
2 Solve $\cos x = -\frac{\sqrt{3}}{2}$ for $0 \leq x \leq 360°$.	
3 Statement: "$n^2 + n$ is a multiple of 6 for every positive integer n." Find a counter-example.	
4 Find (a) $\int \frac{2}{4x+6}\,dx$, (b) the exact value of $\int_0^3 \frac{2}{4x+6}\,dx$.	
5 A block of mass 2 kg is projected along a rough horizontal surface with speed 2.8 m s^{-1} and comes to rest after sliding 2 m. Take g = 9.8 m s^{-2}. Use work and energy to find the coefficient of friction.	

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6 The line $y = -x + 18$ meets the circle $(x - 2)^2 + (y - 3)^2 = 169$ at the points A and B. Find the coordinates of A and B, and the exact length of the chord AB.	
7 X ~ B(12, 0.5) and Y ~ B(11, 0.6) are independent. Find P(X = 5 and Y ≤ 6), to 3 significant figures.	
8 Find the exact value of $\int_1^4 (2x^3 + 1 - \frac{1}{x^2})\,dx$.	
9 Solve the equation $2^{2x} + 2^x - 2 = 0$.	
10 A remote-control car moves with constant velocity $(-20\mathbf{i} - 21\mathbf{j})$ m s^{-1}, where $\mathbf{i}$ and $\mathbf{j}$ are unit vectors east and north. Find its speed and the acute angle its direction makes with $\mathbf{i}$, to 1 d.p.	