Day 83	A Level Maths: B Tier 10-a-day
1 A crate of mass 3 kg is pulled along rough horizontal ground by a horizontal force of 8.85 N. It accelerates at 0.5 m s^{-2}. Take g = 9.8 m s^{-2}. Find the coefficient of friction between the crate and the ground.	
2 Solve $x^2 - 8x + 12 \geq 0$.	
3 Regression line (x from 2 to 18): $y = 60 - 2.5x$. x is the temperature, y the gas used per day. (a) Interpret the gradient. (b) Estimate y when x = 21 and comment.	
4 Given that $y = \frac{\ln x}{x^2}$, find $\frac{dy}{dx}$, and its value when x = 1.	
5 P(B) = 0.4, P(A | B) = 0.6 and P(A) = 0.6. (a) Find $P(A \cap B)$. (b) Find P(B | A). (c) Find $P(A \cup B)$.	

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6 A block of mass 3 kg is released from rest on a rough plane inclined at angle α to the horizontal, where $\tan\alpha = \frac{5}{12}$. The coefficient of friction is 0.2. Take $g = 9.8$ m s^{-2}. Find the acceleration down the plane, and the distance moved in 3 s.	
7 Solve $5\cos^2 x - 3\sin x - 5 = 0$ for $0 \leq x \leq 360°$, giving answers to 1 d.p. where necessary.	
8 A circle passes through A(7, −4) and B(−5, 2), and its centre lies on the y-axis. Find the centre and the equation of the circle.	
9 The area of a square increases at a constant rate of 6 $cm^2 s^{-1}$. Find the rate of increase of the side length when the side is 5 cm.	
10 Solve $(x - 4)(x + 3)(x - 3) < 0$.	