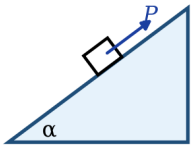
Day 208	A Level Maths: B Tier 10-a-day
1 A summary of the times, t minutes, taken by 8 people to complete a puzzle gives $\Sigma t = 194$ and $\Sigma t^2 = 6050$. Find the mean and the standard deviation (3 s.f.).	
2 Solve $7^x < 231$, giving your answer to 3 s.f.	
3 A lorry travelling at 24 m s^{-1} brakes and comes to rest with constant deceleration 1 m s^{-2}. Find (a) the distance travelled while braking, (b) the time taken to stop.	
4 A curve has equation $3x^2y + xy + 3y^3 = 24$. Find $\frac{dy}{dx}$ in terms of x and y, and the gradient at (0, 2).	
5 A player says she scores with probability 0.3. In 30 shots she scores 7 times. Test, at the 5% level, whether the true proportion is lower than claimed.	

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6 Find the exact value of $\int_1^3 (x^2 + \frac{4}{x})\,dx$.	
7 The line $y = -8x + 3$ meets the circle $x^2 + (y - 3)^2 = 65$ at the points A and B. Find the coordinates of A and B, and the exact length of the chord AB.	
8 A block of mass 10 kg is held on a rough plane ($\tan\alpha = \frac{3}{4}$, $\mu = 0.5$) by a force P N up the plane, as shown. Take $g = 9.8$ m s^{-2}. The block is about to move down the plane. Find P. 	
9 Solve $\lvert 4x + 6\rvert < 5$.	
10 A circle passes through A$(-7, -2)$ and B$(-4, 7)$, and its centre lies on the x-axis. Find the centre and the equation of the circle.	