Day 81	A Level Maths: C Tier 10-a-day
1 θ is acute and $\sin\theta = \frac{3}{5}$. Find the exact values of $\cos\theta$ and $\tan\theta$.	
2 A particle starts from rest and moves in a straight line with constant acceleration 1 m s^{-2}. It travels 8 m. Find the time taken.	
3 A is (3, −3) and B is (3, −9). Find (a) the midpoint of AB, (b) the length of AB, as a surd in simplest form.	
4 In a histogram, the class 0 to 20 has frequency 10 and is drawn with a bar of height 2.5 cm. The class 20 to 30 has frequency 10. Find the height of its bar.	
5 A circle has equation $(x + 2)^2 + (y + 4)^2 = 36$. Determine whether the point P(8, −3) is inside, outside or on the circle.	

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6 Find the equation of the normal to the curve $y = e^{2x} + x$ at the point where $x = 0$.	
7 A particle moves in a straight line. Its velocity at time t seconds ($0 \leq t \leq 6$) is $v = (-t^2 + 6t)$ m s^{-1}. Find the maximum velocity and the time at which it occurs.	
8 Use the quotient rule to find the derivative of $y = \frac{e^x}{3x + 1}$.	
9 The discrete random variable X has this distribution. x: 0, 3, 7, 8 P(X = x): 0.5, 0.2, 0.1, 0.2 Find E(X) and Var(X).	
10 Find the set of values of x satisfying both $2x + 1 < -9$ and $x^2 + 8x + 12 < 0$.	