Day 163	A Level Maths: B Tier 10-a-day
1 A coach accelerates uniformly from rest at 3 m s^{-2} for 6 s, then travels at constant speed for 30 s, and finally decelerates uniformly at 0.5 m s^{-2} to rest. Find the total distance travelled and the total time of the journey.	
2 Given that $y = \sqrt{2x + 17}$, find $\frac{dy}{dx}$, and the gradient of the curve when x = 4.	
3 P(A) = 0.25, P(B) = 0.5, P(A ∩ B) = 0.25. Find (a) P(A ∪ B), (b) P(A | B). (c) Are A and B independent?	
4 A curve has equation $y = \frac{6}{x - 4} - 1$. (a) Write down the asymptotes. (b) Find where the curve crosses the axes.	
5 The volume of a sphere increases at a constant rate of 12 $cm^3 s^{-1}$. Find the rate at which the radius is increasing when r = 5 cm, to 3 s.f.	

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6 A coin is thought to land heads with probability 0.5. It is tossed 20 times and lands heads 5 times. Test, at the 5% significance level, whether the probability of heads is different from 0.5.	
7 Solve $(x - 5)(x - 2)x \leq 0$.	
8 A particle moves on a straight line. Its displacement from O at time t seconds is $s = t^3 - t^2 - 2t$ metres. Find its velocity and acceleration when $t = 3$.	
9 Solve $\cot^2 x = 0$ for $0 \leq x \leq 360°$, giving answers to 1 d.p.	
10 The line $3x + 4y = k$ is a tangent to the circle $(x + 3)^2 + (y + 3)^2 = 25$. Find the two possible values of k.	