Day 292	A Level Maths: C Tier 10-a-day
1 A stone is dropped from rest from the top of a building of height 19.6 m. Take g = 9.8 m s^{-2} and ignore air resistance. Find (a) the time taken to reach the ground, (b) its speed on hitting the ground.	
2 Find (a) $\int 6 \sin 3x \, dx$ (b) $\int 6 \sec^2 3x \, dx$	
3 A company says that the probability a customer buys a ticket is 0.25. A researcher thinks that the probability is different. Let p be the probability that customer buys a ticket. Write down suitable hypotheses for a test on p.	
4 Solve $x^2 + 6x - 6 = 0$, giving your answers in the form $p \pm \sqrt{q}$.	
5 A body moves in a straight line. Its displacement from O at time t seconds is s metres, where $s = 3t^3 + 5t^2 + 6t$. Find its velocity when t = 4.	

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6 $(x - 1)$ is a factor of $x^3 + kx^2 + 3x - 3$. Find the value of k.	
7 Cars pass a checkpoint at an average rate of 0.5 per hour, at random. Find the probability of at most 3 in 3 hours, to 3 s.f.	
8 The curve $y = ab^x$ passes through (0, 5) and $(3, \frac{5}{8})$. Find the values of a and b.	
9 The circle $(x + 1)^2 + (y + 2)^2 = 13$ passes through $P(-3, -5)$. Find the gradient of the tangent to the circle at P.	
10 The table shows values of y = f(x). x: 0 0.25 0.5 0.75 1 1.25 y: 8.4 6.6 3.7 4.3 5.5 5 Use the trapezium rule to estimate the area under the curve between x = 0 and x = 1.25.	