Day 204	A Level Maths: C Tier 10-a-day
1 Differentiate with respect to x: (a) $4 \sin 2x$ (b) $4 e^{2x}$	
2 A boat moving in a straight line increases its speed from 8 m s^{-1} to 11 m s^{-1} with constant acceleration 0.5 m s^{-2}. Find the time taken.	
3 X has probability density function $f(x) = \frac{1}{9}x^2$ for $0 \leq x \leq 3$, and 0 otherwise. Find $P(X < 1)$.	
4 The point $P(-4, -6)$ lies on the curve $y = f(x)$. Write down the coordinates of the image of P on (a) $y = f(-x)$ (b) $y = f(x + 4)$	
5 Use the trapezium rule with 5 strips to estimate $\int_0^4 2^x \, dx$, giving your answer to 3 significant figures.	

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6 Expand $(1 + 4x)^{-1}$ in ascending powers of x up to and including the term in x^2. State the range of values of x for which the expansion is valid.	
7 A resultant force of 12.5 N gives a body an acceleration of 2.5 m s^{-2}. Find the mass of the body.	
8 The line $y = -4x + k$ is a tangent to the curve $y = x^2 - 10x + 6$. Find the value of k.	
9 The probability that a patient takes the drug is 0.5. If so, the probability that the patient recovers is 0.5; otherwise it is 0.4. Given that the patient recovers, find the probability that a patient takes the drug.	
10 Differentiate y = cosec 3x with respect to x.	