Day 340	A Level Maths: C Tier 10-a-day

1 Find

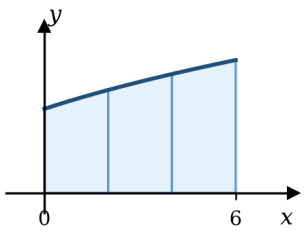
(a) $\int 8 \sec^2 2x \, dx$

(b) $\int 8 e^{2x} \, dx$

2 M(−1, −5) is the midpoint of the line segment AB.
A is the point (−4, −5). Find the coordinates of B.

3 For 20 values, $\Sigma x = 560$ and $\Sigma x^2 = 16060$.
Find the mean and the standard deviation.

4 The diagram shows the curve $y = \sqrt{x + 4}$ from x = 0 to x = 6 divided into 3 strips of equal width.
Use the trapezium rule with these strips to estimate the shaded area to 3 s.f.



5 A particle of mass 10 kg changes its speed from 4 m s^{-1} to 10 m s^{-1}. Find the increase in its kinetic energy.

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6 Use the substitution $u = x^2 + 3$ to find $\int \frac{4x}{x^2 + 3}\, dx$.	
7 Express $\frac{-3x + 10}{(x + 2)(x - 2)}$ in partial fractions.	
8 A particle is on the point of sliding down a rough plane inclined at α to the horizontal, where $\tan \alpha = \frac{20}{21}$. Find the coefficient of friction.	
9 The line $y = -2x + k$ is a tangent to the curve $y = x^2 + 2x + 1$. Find the value of k.	
10 The product moment correlation coefficient between hours of sunshine and ice cream sales is $r = 0.62$. Interpret this value.	