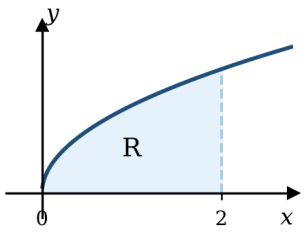
Day 342	A Level Maths: B Tier 10-a-day
1 Solve $3x + 4 \leq 2x - 9$.	
2 The vector $\mathbf{a} = \begin{pmatrix} 8 \\ -8 \\ -4 \end{pmatrix}$. Find $\lvert\mathbf{a}\rvert$ and a unit vector in the direction of $\mathbf{a}$.	
3 Simplify $\sqrt{20} + \sqrt{245} + \sqrt{80}$, giving your answer in the form $k\sqrt{5}$.	
4 A block slides from rest down a line of greatest slope of a smooth plane inclined at α, where $\sin\alpha = \frac{3}{5}$ to the horizontal. Take $g = 9.8$ m s^{-2}. Find its acceleration, and the distance it travels in 2 s.	
5 Solve $5^{-3x} = 125^{4x}$.	

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6 The region R is bounded by the curve $y = \sqrt{5}\sqrt{x}$, the x-axis
and the lines x = 0 and x = 2.
R is rotated through 360° about the x-axis. Find the exact volume generated.



7 The length X cm of a metal rod is normal with s.d. 3.
Given P(X < 177) = 0.99, find the mean (3 s.f.).

8 A population is modelled by $N = N_0e^{kt}$, where t is in hours. Initially N = 1000 and after 4 hours N = 2400.
Find (a) k to 3 s.f., (b) when N reaches 5000, to 3 s.f.

9 A journey takes X minutes, normal with mean 170, s.d. 8.
Find, to 3 s.f., the probability a value is
(a) more than 182,
(b) between 182 and 194.

10 A car travelling at 20 m s^{-1} brakes and comes to rest with constant deceleration 4 m s^{-2}.
Find (a) the distance travelled while braking, (b) the time taken to stop.