Day 82 **A Level Maths: B Tier 10-a-day**

1 Solve $4^x > 174$, giving your answer to 3 s.f.

2 Solve $3x - 1 \geq x - 6$.

3 Find (a) $\int e^{5x}\,dx$,

(b) the exact value of $\int_0^1 e^{5x}\,dx$.

4 A golf ball is hit from the ground at 49 m s^{-1} at angle θ to the horizontal, where $\sin\theta = \frac{3}{5}$.

Take g = 9.8 m s^{-2}.
Find (a) the greatest height, (b) the speed of the ball at the greatest height.

5 The table summarises 46 measurements of d.
(a) Estimate the mean.
(b) Estimate the median using linear interpolation.

d (cm)	Frequency
$0 \leq d < 10$	13
$10 \leq d < 20$	11
$20 \leq d < 30$	9
$30 \leq d < 40$	8
$40 \leq d < 50$	5

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6 Find the coefficient of x^2 in the expansion of $(1 - x)(1 + x)^5$.	
7 A class of width 10, frequency 12, is a bar 2.5 cm wide, 2.4 cm tall. (a) Find the bar height for width 40, frequency 15. (b) Find the frequency of a 3 cm by 2 cm bar.	
8 A sledge of mass 5 kg is pulled across smooth horizontal ice by a rope with tension 40 N, inclined at α above the horizontal, where $\tan \alpha = \frac{4}{3}$. Take $g = 9.8$ m s^{-2}. Find (a) the acceleration of the sledge, (b) the normal reaction of the ice.	
9 (a) Write $\frac{4x + 15}{(x + 3)(x + 4)}$ in partial fractions. (b) Hence evaluate $\int_0^1 \frac{4x + 15}{(x + 3)(x + 4)}\,dx$, giving the answer as a single logarithm.	
10 Express $\frac{5x^2 + 22x + 36}{(x - 3)(x + 4)^2}$ in partial fractions.	