Day 333	A Level Maths: B Tier 10-a-day
1 Solve $2x^2 - 11x \leq -12$.	
2 The mass X g of a flour bag is normal with mean 45, s.d. 0.5. Find k (3 s.f.): (a) P(X < k) = 0.05, (b) P(X > k) = 0.1.	
3 A sector of a circle has radius 8 cm and angle 90°. Find, in terms of π, the arc length and the area of the sector.	
4 A particle moves on a straight line. Its displacement from O at time t seconds is $s = 4t^3 - 2t^2 - t$ metres. Find its velocity and acceleration when t = 4.	
5 A curve has equation $y = \frac{-1}{x - 2} - 3$. (a) Write down the asymptotes. (b) Find where the curve crosses the axes.	

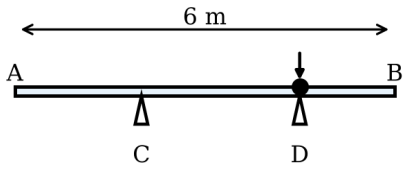
Day 333 **A Level Maths: B Tier 10-a-day**

6 A class of width 10, frequency 24, is a bar 5 cm wide, 2.4 cm tall.
(a) Find the bar height for width 10, frequency 30.
(b) Find the frequency of a 1 cm by 2 cm bar.

7 A geometric sequence has first term 500 and common ratio 0.5.
Find the smallest n for which the nth term is less than 0.01.

8 Solve $e^{2x} - 2e^{x} - 15 = 0$,
giving any answers as exact values.

9 A uniform beam AB of length 6 m and mass 60 kg rests horizontally on supports at C and D, where AC = 2 m and BD = 1.5 m.
A particle of mass 5 kg is placed on the beam 1.5 m from B. Take $g = 9.8$ m s^{-2}.
Find the reactions at C and D.



10 Line l_1: $\mathbf{r} = \begin{pmatrix} 2 \\ -2 \\ 1 \end{pmatrix} + \lambda \begin{pmatrix} -2 \\ 3 \\ -2 \end{pmatrix}$.

Line l_2: $\mathbf{r} = \begin{pmatrix} 8 \\ 4 \\ -1 \end{pmatrix} + \mu \begin{pmatrix} 3 \\ 3 \\ -1 \end{pmatrix}$.

Show that l_1 and l_2 intersect and find the point.