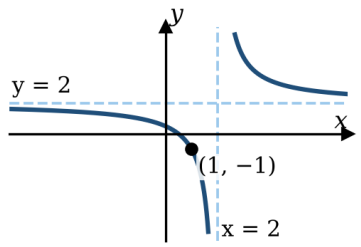
Day 101	A Level Maths: A Tier 10-a-day
1 P(A) = 0.65, P(B) = 0.1 and P(A ∩ B) = 0.05. Find (a) P(A ∪ B) (b) P(B | A) (c) P(A′ ∩ B′)	
2 A 15 kg box is pulled from rest along rough horizontal ground by a horizontal force of 85.5 N and moves 40 m in 10 s. Find (a) the coefficient of friction. The force is then removed; (b) find the further distance moved. Take g = 9.8. Give answers to 3 s.f. if not exact.	
3 The 6th term of an arithmetic sequence is 28 and the 14th term is 76. Find the first term and common difference, and the sum of the first 20 terms.	
4 Forces $F_1 = (6\mathbf{i} + 2\mathbf{j})$ N, $F_2 = (12\mathbf{i} - 9\mathbf{j})$ N and $F_3 = (a\mathbf{i} + b\mathbf{j})$ N keep a 3 kg particle in equilibrium. Find (a) a and b. F_2 is then removed; (b) find the magnitude of the acceleration.	
5 $f(x) = x^2 + 8x + 18$, $x \geq -4$. Find $f^{-1}(x)$ and state its domain.	

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6 Solve $2\sec^2\theta + 8\tan\theta + 4 = 0$
for $0° \leq \theta \leq 360°$. Give answers to 1 d.p.

7 The diagram shows the curve $y = \frac{k}{x - a} + b$
with asymptotes as shown. Find the values of k, a and b, and the coordinates where the curve crosses the axes.



8 Use integration by parts to find the exact value of
$\int_0^{\frac{\pi}{4}} x\cos 2x\,dx$.

9 The masses in grams of two groups: factory A has n = 28, mean 57, sd 4;
factory B has n = 20, mean 33, sd 2.
Find the mean and standard deviation of all 48 values (3 s.f. for the sd).

10 (a) Express $\frac{2x + 5}{(x + 4)^2}$ in the form $\frac{A}{x + 4} + \frac{B}{(x + 4)^2}$.

(b) Hence find the exact value of $\int_0^4 \frac{2x + 5}{(x + 4)^2}\,dx$.