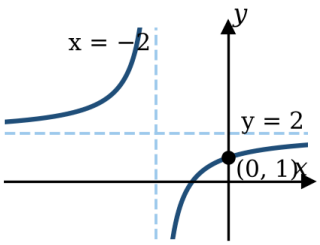
Day 264	A Level Maths: C Tier 10-a-day
1 Differentiate with respect to x: (a) 4 sin 2x (b) 4 ln x	
2 In an arithmetic sequence $u_5 = 6$ and $u_{12} = 20$. Find the first term and the common difference.	
3 The vector $\mathbf{p} = -5\mathbf{i} + 12\mathbf{j}$. Find (a) $\lvert\mathbf{p}\rvert$, (b) the angle p makes with the positive x-axis, measured anticlockwise (1 d.p.).	
4 The circle $x^2 + (y + 3)^2 = 169$ passes through P(5, 9). Find the gradient of the tangent to the circle at P.	
5 The table shows grouped data. Class: $0 \leq x < 5$; $5 \leq x < 10$; $10 \leq x < 15$; $15 \leq x < 20$ Frequency: 5, 6, 3, 9 Estimate the median, to 3 s.f.	

Day 264 **A Level Maths: C Tier 10-a-day**

6 A block of mass 5 kg is pulled along rough horizontal ground by a horizontal force of 32.1 N.
The coefficient of friction is 0.4. Take g = 9.8 m s^{-2}. Find the acceleration.

7 The diagram shows the graph of $y = \frac{k}{x - a} + c$ with its asymptotes. Find the values of a, c and k.



8 The continuous random variable X has probability density function $f(x) = kx^3$ for $0 \leq x \leq 1$, and 0 otherwise.
Find the value of k.

9 A ball is dropped from rest from the top of a tower of height 44.1 m. Take g = 9.8 m s^{-2} and ignore air resistance. Find (a) the time taken to reach the ground, (b) its speed on hitting the ground.

10 The diagram shows the curve $y = x^3 - 9x^2 + 24x + 5$.
A and B are turning points. Find the coordinates of A and B.

