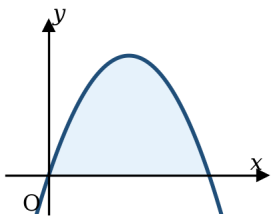
Day 63	A Level Maths: C Tier 10-a-day

1 Classify each variable as qualitative, discrete or continuous.
(a) the number of cars in a car park
(b) the make of a car
(c) the eye colour of a pupil

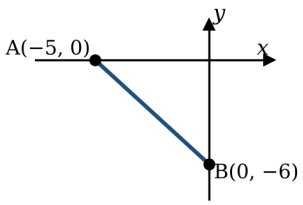
2 A car travelling at 12 m s^{-1} brakes uniformly and comes to rest after travelling 36 m.
(a) Find the deceleration.
(b) Find the time taken to stop.

3 The diagram shows the curve $y = x(3 - x)$.
Find the area of the shaded region, between the curve and the x-axis.



4 A particle of mass 5 kg slides from rest down a smooth plane inclined at angle α to the horizontal, where $\sin \alpha = \frac{4}{5}$. Take g = 9.8 m s^{-2}.
Find (a) its acceleration, (b) its speed after 3 s.

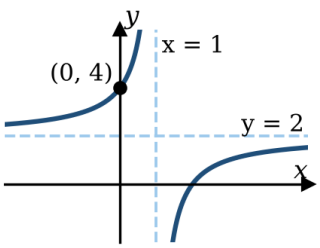
5 The diagram shows a line meeting the axes at A and B.
Find (a) the equation of AB in the form px + qy = r with integers p, q and r, (b) the length AB.



Day 63 **A Level Maths: C Tier 10-a-day**

6 Express $4 \sin x + 3 \cos x$ in the form $R \sin(x + \alpha)$, where $R > 0$ and $0° < \alpha < 90°$.
Give α to 1 decimal place.

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 A radioactive sample has mass $M = 100\, e^{-0.05t}$ grams after t days.
Find the time for the mass to halve, to 3 significant figures.

9 The line $y = -3x + k$ is a tangent to the curve $y = x^2 - x + 5$.
Find the value of k.

10 X has probability density function $f(x) = \frac{1}{2}x$ for $0 \leq x \leq 2$, and 0 otherwise.
Find $P(X < 1)$.