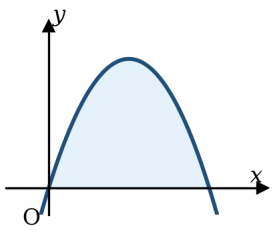
Day 43 **A Level Maths: C Tier 10-a-day**

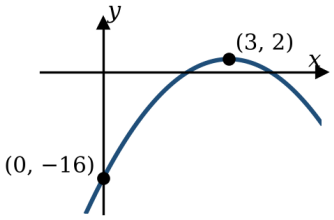
1 The line l has equation $y = -2x + 1$.
Find the equation of the line perpendicular to l that passes through (1, 1).

2 A train moving in a straight line with constant acceleration increases its speed from 4 m s^{-1} to 9 m s^{-1} in 6 s.
Find the distance it travels in this time.

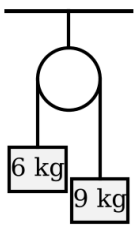
3 The diagram shows the curve $y = 2x(3 - x)$.
Find the area of the shaded region, between the curve and the x-axis.



4 The diagram shows a sketch of a quadratic curve.
Find its equation in the form $y = a(x - p)^2 + q$.



5 A line has equation $\mathbf{r} = \begin{pmatrix} 1 \\ 4 \\ 3 \end{pmatrix} + t\begin{pmatrix} 2 \\ -2 \\ 2 \end{pmatrix}$.
Find the coordinates of the point on the line where t = 2.

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6 A circle has equation $x^2 + (y + 1)^2 = 25$. Determine whether the point P(−6, −2) is inside, outside or on the circle.	
7 Use a double angle formula to find $\int \sin^2 2x \, dx$.	
8 The probability that a machine is set up wrongly is 0.6. If so, the probability that an item is faulty is 0.3; otherwise it is 0.2. Given that an item is faulty, find the probability that a machine is set up wrongly.	
9 Two particles of masses 6 kg and 9 kg hang from the ends of a light inextensible string over a smooth pulley and are released from rest. Take g = 9.8 m s^{-2}. Find the acceleration and the tension in the string. 	
10 The table summarises the number of pets owned by 50 people. Pets, x: 0, 1, 2, 3, 4 Frequency, f: 9, 22, 12, 3, 4 Find the mean.	