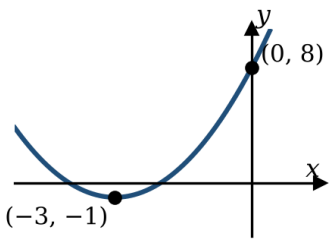
Day 166 **A Level Maths: C Tier 10-a-day**

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



2 A resultant force of 16 N gives a body an acceleration of 2 m s^{-2}. Find the mass of the body.

3 Find
(a) $\int \frac{3}{x}\, dx$
(b) $\int (3e^x + \frac{3}{x})\, dx$

4 A curve has parametric equations
$x = t - 1$, $y = t^2 - 3$.
Find a Cartesian equation of the curve.

5 The product of x and $(75 - x^2)$ is $P = 75x - x^3$, $x > 0$.
Find the maximum value of P.

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6 The table shows grouped data. Class: $20 \leq x < 40$; $40 \leq x < 60$; $60 \leq x < 80$; $80 \leq x < 100$ Frequency: 12, 3, 15, 15 Estimate the mean, to 3 s.f.	
7 Solve $-4\sin^2 x + 6\cos x + 6 = 0$ for $0° \leq x \leq 360°$.	
8 A particle moves in a straight line. Its velocity at time t seconds ($0 \leq t \leq 6$) is $v = (-2t^2 + 12t)$ m s^{-1}. Find the maximum velocity and the time at which it occurs.	
9 The probability that a machine is set up wrongly is 0.6. If so, the probability that an item is faulty is 0.6; otherwise it is 0.4. Given that an item is faulty, find the probability that a machine is set up wrongly.	
10 The line $y = x + k$ is a tangent to the curve $y = x^2 + 3x + 6$. Find the value of k.	