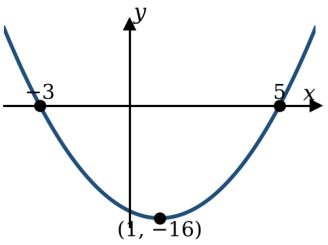
Day 220 **A Level Maths: B Tier 10-a-day**

1 A van of mass 1000 kg moves along a straight horizontal road. The engine produces a driving force of 2000 N and the resistance to motion is 900 N.
Find the acceleration of the van.

2 Given that $y = e^{3x - 6}$,
find $\frac{dy}{dx}$, and the gradient of the curve when x = 2.

3 The diagram shows the curve y = f(x), a quadratic.
(a) Find the coordinates of the local maximum point of y = |f(x)|.
(b) How many solutions has |f(x)| = 18?



4 A summary of the ages, a years, of 7 members of a club gives $\Sigma a = 195$ and $\Sigma a^2 = 6131$.
Find the mean and the standard deviation (3 s.f.).

5 A particle P moves on a straight line from O. At time t s its velocity is $6t^2 - 48t + 72$ m s^{-1}.
Find the first time P is at instantaneous rest, and its distance from O then.

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6 Given that $\sum_{r=1}^{n}(3r + 4) = 325$, find the value of n.	
7 Solve $3\tan^2 x + \sec x - 1 = 0$ for $0 \leq x \leq 360°$, giving answers to 1 d.p.	
8 Express $\frac{-2x^2 - 3x + 3}{(x + 3)(x + 2)^2}$ in partial fractions.	
9 The scores on a test are normally distributed. $P(X < 68) = 0.0668$ and $P(X > 88) = 0.1587$. Find the mean and standard deviation (3 s.f.).	
10 Given that $\sin A = \frac{12}{13}$ and $\sin B = \frac{15}{17}$, where A is obtuse and B is acute, find the exact value of $\cos(A - B)$.	