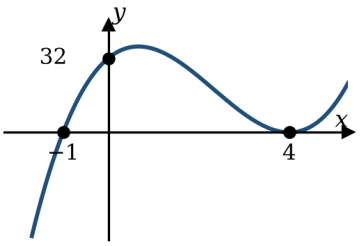
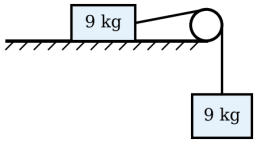
Day 197	A Level Maths: B Tier 10-a-day
1 A summary of the times, t minutes, taken by 9 people to complete a puzzle gives $\Sigma t = 260$ and $\Sigma t^2 = 8582$. Find the mean and the standard deviation (3 s.f.).	
2 Simplify $\sqrt{294} - \sqrt{24} - \sqrt{96}$, giving your answer in the form $k\sqrt{6}$.	
3 Differentiate $y = 5 \operatorname{cosec} 3x$ with respect to x, and find the exact gradient when $x = \frac{\pi}{12}$.	
4 A woman of mass 75 kg stands on weighing scales in a lift. The lift decelerates at 0.5 m s^{-2} while moving upwards. Take g = 9.8 m s^{-2}. Find the force exerted on the woman by the scales.	
5 Use the substitution $u = \ln x$ to find the exact value of $\int_1^{e^2} \frac{(\ln x)^3}{x} \, dx$.	

Day 197 **A Level Maths: B Tier 10-a-day**

6 The diagram shows a sketch of the curve y = f(x), where f is a cubic. The curve meets the axes at the labelled points. Find f(x) in factorised form.



7 A block of mass 9 kg lies on a rough horizontal table (coefficient of friction 0.4). It is joined by a light string over a smooth pulley to a particle of mass 9 kg hanging freely.
Take g = 9.8 m s^{-2}.
The system is released. Find the acceleration and the tension in the string.



8 A curve has equation $y = \frac{-2}{x+1} - 1$.
(a) Write down the asymptotes.
(b) Find where the curve crosses the axes.

9 8 pairs of age of a house and its energy cost give r = 0.660.
One-tailed critical value (5%): 0.6215.
Test for positive correlation.

10 A has position vector $\begin{pmatrix} -2 \\ 4 \end{pmatrix}$ and B has position vector $\begin{pmatrix} -2 \\ -2 \end{pmatrix}$.
The point P lies on AB with AP : PB = 1 : 2.
Find the position vector of P.