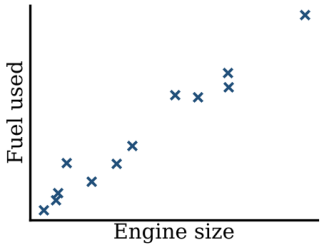
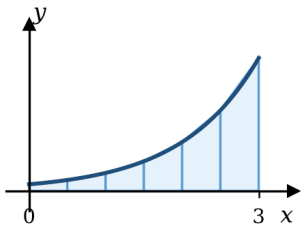
Day 290 **A Level Maths: C Tier 10-a-day**

1 The scatter diagram shows engine size and fuel used for a group.
Describe the correlation.



2 A geometric series has first term 11 and common ratio $-\frac{1}{2}$.
Find the sum to infinity.

3 The diagram shows the curve $y = e^x$ from $x = 0$ to $x = 3$ divided into 6 strips of equal width.
Use the trapezium rule with these strips to estimate the shaded area to 3 s.f.



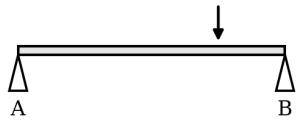
4 $f(x) = \frac{1}{x+2}$, $x \neq -2$.
Find $f^{-1}(x)$.

5 A train starts from rest and accelerates uniformly at 1 m s^{-2} for 8 s, then travels at constant speed for a further 20 s. Find the total distance travelled.

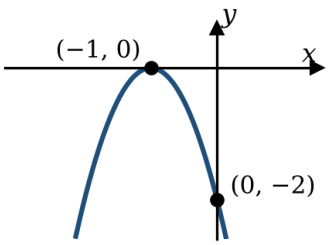
Day 290 **A Level Maths: C Tier 10-a-day**

6 Solve $\ln(x + 9) - \ln x = \ln 4$.

7 A uniform beam AB of mass 15 kg and length 6 m rests horizontally on supports at A and B. A load of mass 25 kg is placed on the beam 4.5 m from A. Take $g = 9.8$ m s^{-2}. Find the reaction at B.



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



9 $X \sim B(20, p)$. H_0: $p = 0.3$, H_1: $p < 0.3$.
In a sample, $x = 2$. It is given that $P(X \leq 2) = 0.0355$.
Test H_0 at the 5% significance level.

10 $f(x) = x^2 - 2$.
Use the Newton-Raphson method with $x_0 = 2$ to find x_1 and x_2,
giving your answer to 3 decimal places.