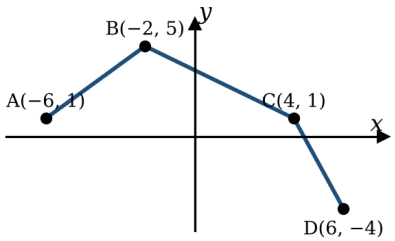
Day 162 **A Level Maths: S Tier 10-a-day**

1 Solve $\sqrt{3x + 7} = x + 1$.

2 X ~ B(400, 0.01).
(a) Explain why a Poisson approximation is suitable and state its distribution.
(b) Use it to estimate P(X > 2), to 4 s.f.
(c) Find the exact value of P(X > 2), to 4 s.f.

3 Solve $\sin(\theta + 40°) = -\frac{\sqrt{3}}{2}$
for $-90° \leq \theta \leq 270°$.

4 The diagram shows y = f(x), made of three straight line segments. Find the coordinates of the images of A, B, C and D on the graph of $y = 3f(2x - 8) - 4$.



5 A particle P moves on a straight line. At time t seconds its velocity is v m s^{-1}, where
$v = t^2 - 5t + 6$ for $0 \leq t \leq 5$
Find (a) the times at which P is at instantaneous rest, (b) the total distance travelled by P in the first 5 seconds.

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6 Find the exact coordinates of the stationary points of $y = \frac{x}{x^2 + 16}$, and determine the nature of each.	
7 Car A passes a point O travelling at a constant speed of 12.8 m s^{-1}. 4 s later, car B leaves O from rest with constant acceleration 2 m s^{-2}, travelling in the same direction. B overtakes A at the point X. Find (a) the time B takes to reach X, (b) the distance OX, (c) the speed of B at X.	
8 The curve C has equation $x^2 + xy + 4y^2 = 60$. Find the coordinates of the points on C where the tangent is parallel to the y-axis.	
9 Find the binomial expansion of $(9 + 6x)^{\frac{3}{2}}$ in ascending powers of x up to and including the term in x^3. State the values of x for which it is valid.	
10 A student's time on a task, in minutes, is N(70, 4^2). Given that it exceeds 74, find the probability that it exceeds 77.	