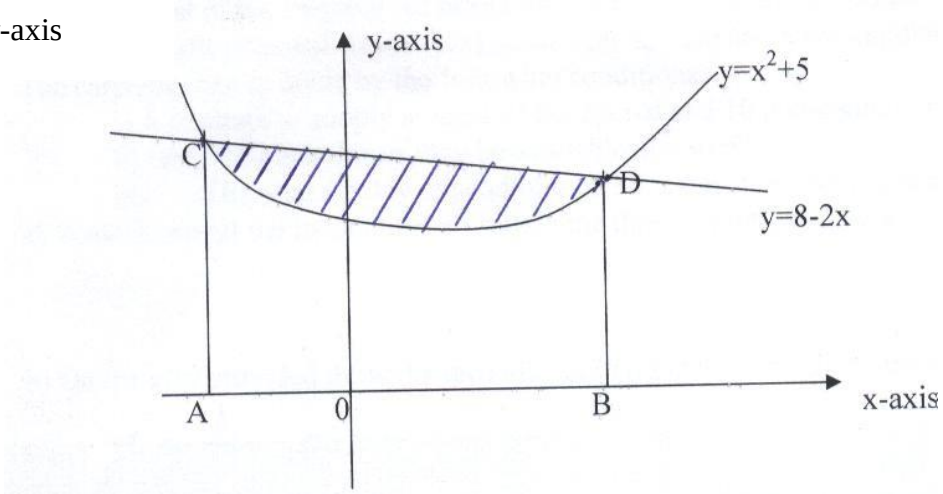
5. Integration

1. The diagram below, not drawn to scale shows part of the curve $y = x^2+5$ and the line $y = 8-2x$. The line intersects the curve at points C and D. Lines AC and BD are parallel to the y-axis.

the y-axis



a) Determine the coordinates of C and D (4 mks)

b) Use integration to calculate the area bounded by the curve and the x- axis between the points C and D (3 mks)

c) Calculate the area enclosed by the lines CD, CA, BD and the x-axis (2 mks)

d) Hence determine the area of the shaded region (1 mk)

2. Evaluate:- $$\int_{2}^{5} \frac{x^2 - 3x + 2}{x - 2}\, dx$$

3. Find the values of **a** which satisfy the integral
$\int_0^a (x^2 + 1)\, dx = 2a$