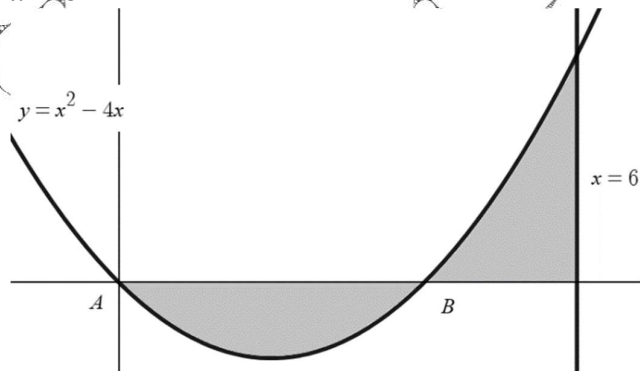


(78) Integration ('Negative and Positive Areas')

WORKING AT D/E

(1) The diagram below shows part of the curve with equation $y = x^2 - 4x$ and the line with equation $x = 6$



The curve crosses the x axis at the points A and B .

- Find the coordinates of A and B .
- Find $\int (x^2 - 4x) dx$
- Hence, using calculus, show that the total shaded area trapped between the curve, the positive x axis and the line $x = 6$ is $\frac{64}{3}$ units.

(2) (a) Sketch the curve of

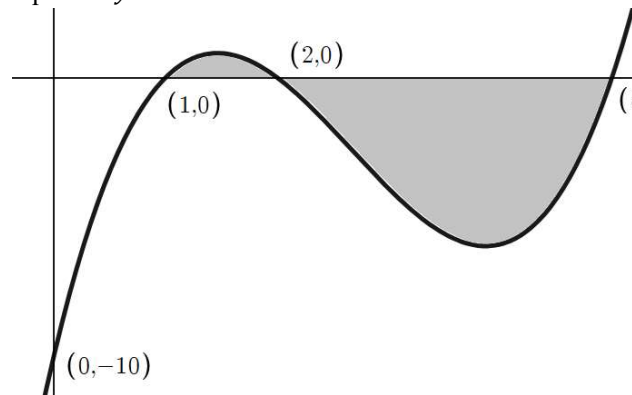
$$y = (x + 2)(x - 1)(x - 4)$$

- Hence, show without a calculator, that the total area trapped between the curve and the x axis from $x = -2$ to $x = 4$ is $\frac{81}{2}$ units.

WORKING AT B/C

- (a) Sketch the graph of $y = x^2 - x - 6$
- Hence, show that the total area trapped between the curve, and the x axis from $x = -2$ to the line with equation $x = 5$ is $\frac{67}{2}$

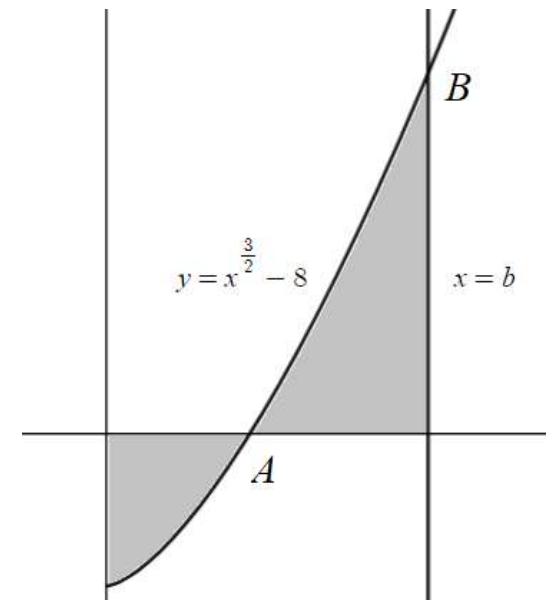
(2) The diagram below shows part of the graph with equation $y = x^3 + bx^2 + cx + d$



- Show that $b = -8$, $c = 17$ and $d = -10$
- Use integration to find the total shaded area.

WORKING AT A*/A

(1) The diagram below shows the curve of $y = x^{\frac{3}{2}} - 8$, $x \geq 0$ and the line with equation $x = b$



- The curve crosses the x axis at the point A . Find the coordinates of A .
- The curve and the line meet at the point B . Given that the coordinates of B are $(b, 19)$, find the value of b .
- Showing full workings, find the total shaded area shown trapped between the lines $x = 0$ and $x = b$ and the positive x axis.

(2) Showing full workings, find the total area trapped between the curve of $y = \frac{1}{x^2} - 3$, the positive x axis and the lines $x = \frac{1}{3}$ and $x = 1$. Give your answer in exact form.