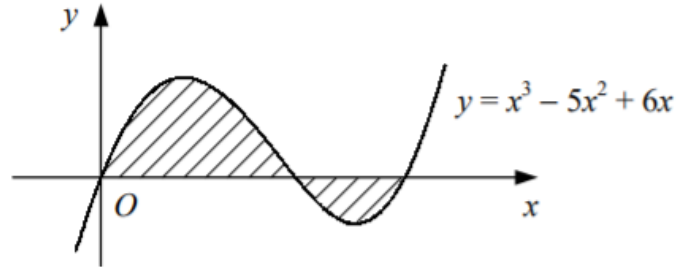


1. The diagram shows the curve with equation $y = x^3 - 5x^2 + 6x$



- a. Find the coordinates of the points where the curve crosses the x -axis. **(2)**
- b. Show that the total area of the shaded regions enclosed by the curve and the x -axis is $3\frac{1}{12}$ **(5)**

This image shows a single sheet of white paper with horizontal blue ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

Solutions

1a.

$x^3 - 5x^2 + 6x = 0$ $x(x-2)(x-3) = 0$	M1
$x = 0, 2 \text{ and } 3$	M1
$(0, 0)$ $(2, 0)$ $(3, 0)$	

1b.

$\int_0^2 (x^3 - 5x^2 + 6x) dx$ $= [\frac{1}{4}x^4 - \frac{5}{3}x^3 + 3x^2]_0^2$	M1
$= (4 - \frac{40}{3} + 12) - 0 = \frac{8}{3}$	M1
$\int_2^3 (x^3 - 5x^2 + 6x) dx$ $= [\frac{1}{4}x^4 - \frac{5}{3}x^3 + 3x^2]_2^3$	M1
$= (\frac{81}{4} - 45 + 27) - \frac{8}{3}$ $= -\frac{5}{12}$	M1
Total Area $= \frac{8}{3} + \frac{5}{12} = 3\frac{1}{12}$	M1

