Partial fractions the Integration

Q1

(b) (i) Write

$$\frac{11-4x}{(x-2)(2x-1)}$$

in partial fractions. [5]

(ii) Hence find

$$\int \frac{11-4x}{(x-2)(2x-1)}\,dx$$ [4]

Q2

(i) Write $\dfrac{3x+4}{x(x+1)}$ in partial fractions. [6]

(ii) Hence find the exact area bounded by the curve $y = \dfrac{3x+4}{x(x+1)}$, the x-axis and the lines $x = 2$ and $x = 3$ [7]

[The curve does not cross the x-axis between 2 and 3]

Q3

Use partial fractions to find

$$\int \frac{x+9}{3-2x-x^2}\,\mathrm{d}x \qquad [8]$$

Q4

Show that $\int_1^2 \frac{1}{x^2(x+1)}\,dx = \frac{1}{2} + \ln\left(\frac{3}{4}\right)$.

Q5

Evaluate $\int_0^1 \frac{2x+3}{x^2+3x+2}\,dx$ exactly, expressing your answer as a single logarithm.

Q6

$$\int \frac{2x^2 + x - 7}{(x+3)(x-1)} \, dx$$