

UNIT 5 SOLUTIONS.

$$\int \frac{x^2 - x + 1}{x - 2} dx$$

Divide:

$$\begin{array}{r} x + 1 + \frac{3}{x-2} \\ x-2 \overline{) x^2 - x + 1} \\ \underline{-(x^2 - 2x)} \\ x + 1 \\ \underline{-(x - 2)} \\ 3 \end{array}$$

$$\int \frac{x^2 - x + 1}{x - 2} dx = \int x + 1 + \frac{3}{x - 2} dx$$

$$= \frac{x^2}{2} + x + 3 \int \frac{1}{x - 2} dx \quad \begin{cases} u = x - 2 \\ du = dx \end{cases}$$

$$= \frac{x^2}{2} + x + 3 \int \frac{1}{u} du$$

$$= \frac{x^2}{2} + x + 3 \ln|u| + C$$

$$= \frac{x^2}{2} + x + 3 \ln|x - 2| + C$$