

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

INT-S1-028

$$= \begin{array}{r|l} 1x^3 + 0x^2 + 0x + 2 & 1x^2 + 0x + 1 \\ -x^3 - 0x^2 - x & \hline \hline \text{" } 0x^2 - x + 2 & \\ -0x^2 + 0x + 0 & \hline \hline \text{" } -x + 2 & \end{array}$$

$$\rightarrow x^3 + 2 = (x^2 + 1) \cdot x + (-x + 2)$$

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

$$= \int \frac{\cancel{(x^2 + 1)}x}{\cancel{x^2 + 1}} dx + 2 \int \frac{1}{x^2 + 1} dx - \frac{1}{2} \int \frac{2x}{x^2 + 1} dx$$

$$= \left[\frac{1}{2} x^2 + 2 \operatorname{arctg} x - \frac{1}{2} \ln(x^2 + 1) + K \right]$$