17. $\int \frac{x^2-7x+2}{x-2}\,dx$

Long division:

$$\begin{array}{r} x-5 \\ x-2\,\big)\,x^2-7x+2 \\ -(x^2-2x) \\ \hline -5x+2 \\ -(-5x+10) \\ \hline -8 \end{array}$$

$x(x-2) = x^2-2x$

$-5(x-2)$

$-5x+10$

$= \int \left(x-5+\frac{-8}{x-2}\right)dx$

$= \int x\,dx - \int 5\,dx - 8\int \frac{1}{x-2}\,dx$

$u = x-2 \quad du = dx$

$= \frac{1}{2}x^2 - 5x - 8\int \frac{1}{u}\,du$

$= \frac{1}{2}x^2 - 5x - 8\ln|u| + C$

$= \boxed{\frac{1}{2}x^2 - 5x - 8\ln|x-2| + C}$

18. $\int \frac{x^2-x-2}{x^2-3x+1}\,dx$

Long division:

$$\begin{array}{r} 1 \\ x^2-3x+1\,\big)\,x^2-x-2 \\ -(x^2-3x+1) \\ \hline 2x-3 \end{array}$$

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

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

$u = x^2-3x+1 \quad du = (2x-3)\,dx$

$1\cdot x + \int \frac{1}{u}\,du$

$x + \ln|u| + C$

$\boxed{x + \ln|x^2-3x+1| + C}$

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

$\int \frac{(x+1)(x-1)}{x+1}\,dx$

$\int (x-1)\,dx$

$\boxed{\frac{1}{2}x^2 - x + C}$