**27.1**.

$$\int_0^{\frac{1}{2}} \frac{x^2+x+1}{(x-1)^2(x+1)^2}\,dx = \int_0^{\frac{1}{2}} \left(\frac{1}{4(x+1)^2} + \frac{3}{4(x-1)^2}\right) dx$$
$$= \left[\frac{-1}{4(x+1)} + \frac{-3}{4(x-1)}\right]_0^{\frac{1}{2}}$$

**27.2**.

$$\int_0^1 \frac{x^3+1}{x^2+1} = \int_0^1 \left(\frac{1-x}{x^2+1} + x\right) dx = \int_0^1 \left(\frac{1}{x^2+1} - \frac{x}{x^2+1} + x\right) dx$$
$$= \left[\mathrm{Arctg}(x) - \frac{\log(x^2+1)}{2} + \frac{x^2}{2}\right]_0^1$$

**27.3**.

$$\int_0^1 \frac{x^5}{(x+1)(x^3+1)}\,dx = \int_0^1 \left((x-1) + \frac{x^3-x^2+1}{(x+1)^2(x^2-x+1)}\right) dx$$
$$= \int_0^1 (x-1)\,dx + \int_0^1 \left(\frac{4}{3(x+1)} - \frac{1}{3(x+1)^2} - \frac{x}{3(x^2-x+1)}\right) dx$$
$$= \left[\frac{1}{2}(x-1)^2\right]_0^1 + \left[\frac{4}{3}\log|x+1| + \frac{1}{3(x+1)} - \frac{1}{3}\frac{1}{2}\log|x^2-x+1| - \frac{1}{3}\frac{1}{\sqrt{3}}\mathrm{Arctg}(\frac{2x-1}{\sqrt{3}})\right]_0^1$$