6.14 Practice

For each integral, determine what technique would be useful to solve them. (For additional practice, solve the integral.)

1. $\displaystyle\int \frac{a^3-1}{a^2+1}\,da$
2. $\displaystyle\int \frac{1}{x^2+2x+2}\,dx$
3. $\displaystyle\int \frac{x}{x^2+2x+2}\,dx$
4. $\displaystyle\int \frac{x+1}{x^2+2x+2}\,dx$
5. $\displaystyle\int \frac{x-1}{x^2+2x+3}\,dx$
6. $\displaystyle\int_0^1 t(1-t)^{10}\,dt$
7. $\displaystyle\int x(x-1)(x-2)\,dx$
8. $\displaystyle\int_1^3 r\sqrt{r^2-1}\,dr$
9. $\displaystyle\int_e^{e^2} \frac{1}{x\ln x}\,dx$
10. $\displaystyle\int_0^{\pi/6} \frac{\cos\theta-\cos^3\theta}{\sin^2\theta}\,d\theta$
11. $\displaystyle\int_{-2}^2 x^3\sin(x^2+1)\,dx$
12. $\displaystyle\int \frac{1}{\sqrt{u}e^{\sqrt{u}}}\,du$
13. $\displaystyle\int \frac{1}{\sqrt{1-x-x^2}}\,dx$
14. $\displaystyle\int \frac{2^{\sin\theta}}{\sec\theta}\,d\theta$
15. $\displaystyle\int_{-2}^2 (x+x^2+x^7+\sin x)\,dx$