13. $\int \sqrt[3]{x}\,(x-1)\,dx = \int \left(x^{4/3} - x^{1/3}\right) dx = \left[\frac{3}{7}x^{7/3} - \frac{3}{4}x^{4/3}\right]$

14. $\int \frac{x^2 - x + 1}{\sqrt{x}}\,dx = \int \left(x^{3/2} - x^{1/2} + x^{-1/2}\right) dx = \left[\frac{2}{5}x^{5/2} - \frac{2}{3}x^{3/2} + 2x^{1/2}\right]$

15. $u = x^2 + 1$, $du = 2x\,dx$, so $\int \frac{x}{x^2+1}\,dx = \int \frac{1}{u}\left(\frac{1}{2}\,du\right) = \frac{1}{2}\,[\ln u]$

16. $\int \frac{1}{x^2+1}\,dx = \left[\tan^{-1} x\right]$

17. Let $u = 1 + 2x^3$. Then $du = 6x^2\,dx$, so
$\int x^2\left(1+2x^3\right)^3 dx = \int u^3\left(\frac{1}{6}\,du\right) = \left[\frac{1}{24}u^4\right]$

18. Let $u = 16 - 3x$. Then $x = \frac{1}{3}(16-u)$, $dx = -\frac{1}{3}\,du$, so

$$\int x\sqrt{16-3x}\,dx = \int u^{1/2}\left(\frac{16-u}{3}\right)\left(-\frac{1}{3}\,du\right) = \frac{1}{9}\int \left(16u^{1/2} - u^{3/2}\right) du$$
$$= \frac{1}{9}\left[16 \cdot \frac{2}{3}u^{3/2} - \frac{2}{5}u^{5/2}\right]$$

19. $\int e^{\pi t}\,dt = \left[\frac{1}{\pi}e^{\pi t}\right]$.

20. Integrate by parts with $u = \ln x$, $dv = x^3\,dx \quad\Rightarrow\quad du = dx/x$, $v = x^4/4$:
$\int x^3 \ln x\,dx = \left[\frac{1}{4}x^4 \ln x\right] - \frac{1}{4}\int x^3\,dx$

21. Integrate by parts with $u = x$, $dv = \sec x \tan x\,dx \quad\Rightarrow\quad du = dx$, $v = \sec x$:
$\int x \sec x\, \tan x\,dx = x\sec x - \int \sec x\,dx = x\sec x - \ln|\sec x + \tan x| + C.$

22. Let $u = 2 - 3x$. Then $du = -3\,dx$, so $\int \frac{1}{2-3x}\,dx = -\frac{1}{3}\int \frac{du}{u} = \left[-\frac{\ln|u|}{3}\right]$

23. Let $u = \frac{1}{t}$. Then $du = -\frac{1}{t^2}\,dt$, so $\int \frac{\cos(1/t)}{t^2}\,dt = \int \cos u\,(-du) = -\sin u + C = -\sin\left(\frac{1}{t}\right) + C.$

24. Let $u = \cos x$. Then $du = -\sin x\,dx$, so
$\int \sin x\, \cos(\cos x)\,dx = -\int \cos u\,du = -\sin u + C = -\sin(\cos x) + C.$

25. Since the degree of the numerator is equal to the degree of the denominator, we first change the form of the integrand by using long division.
$\int \frac{6x+1}{3x+2}\,dx = \int \left(2 - \frac{3}{3x+2}\right) dx = 2x - 3\cdot\frac{1}{3}\ln|3x+2| + C = 2x - \ln|3x+2| + C$

26. Let $u = x$, $dv = \cos 3x\,dx \quad\Rightarrow\quad du = dx$, $v = \frac{1}{3}\sin 3x$. Then
$\int x\cos 3x\,dx = \frac{1}{3}x\sin 3x - \frac{1}{3}\int \sin 3x\,dx = \frac{1}{3}x\sin 3x + \frac{1}{9}\cos 3x + C.$