26. $\int \frac{x^2}{3-x^3}\,dx$

LET $u = 3-x^3$

$du = -3x^2$

$\rightarrow -\frac{1}{3}\int \frac{du}{u}$

$= \frac{-1}{3}\ln|u| + C$

$= \frac{-1}{3}\ln|3-x^3| + C$

27. $\int \frac{x^2-4}{x}\,dx$

$= \int \left(x - \frac{4}{x}\right)dx$

$= \frac{1}{2}x^2 - 4\ln|x| + C$

28. $\int \frac{x}{\sqrt{9-x^2}}\,dx$

$u = 9-x^2$

$du = -2x\,dx$

$-\frac{1}{2}\int \frac{du}{u^{1/2}}$

$= \frac{-1}{2}\int u^{-1/2}\,du$

$= \frac{-1}{2}\cdot 2\cdot u^{1/2} + C$

$= -\sqrt{9-x^2} + C$

29. $\int \frac{x^2+2x}{x^3+3x^2-4}\,dx$

$u = x^3+3x^2-4$

$du = (3x^2+6x)\,dx$

$= 3(x^2+2x)\,dx$

$\frac{1}{3}\int \frac{du}{u}$

$= \frac{1}{3}\ln|u| + C$

$= \frac{1}{3}\ln|x^3+3x^2-4| + C$

30. $\int \frac{(\ln x)^2}{x}\,dx$

$u = \ln x \qquad du = \frac{1}{x}\,dx$

$\int u^2\,du = \frac{1}{3}u^3 + C$

$= \frac{1}{3}(\ln x)^3 + C$

31. $\int \frac{1}{x \ln(x^3)}\,dx$

$u = \ln(x^3)$

$du = \frac{1}{x^3} \cdot 3x^2\,dx$

$= \frac{3}{x}\,dx$

$\frac{1}{3}\int \frac{1}{u}\,du$

$= \frac{1}{3}\ln|u| + c$

$= \frac{1}{3}\ln\left|\ln(x^3)\right| + c$

32. $\int \frac{\cos\theta}{\sin\theta}\,d\theta$

$u = \sin\theta$

$du = \cos\theta\,d\theta$

$= \int \frac{du}{u}$

$= \ln|u| + c$

$= \ln|\sin\theta| + c$

33. $\int \tan 5\theta\,d\theta = \int \frac{\sin(5\theta)}{\cos(5\theta)}\,d\theta$

$u = \cos(5\theta) \qquad du = -5\sin(5\theta)$

$= -\frac{1}{5}\int \frac{du}{u} = \frac{-1}{5}\ln|u| + c$

$= -\frac{1}{5}\ln|\cos(5\theta)| + c$

34. $\int e^{-x^4}(-4x^3)\,dx$

$u = -x^4$

$du = -4x^3\,dx$

$= \int e^u\,du$

$= e^u + c$

$= e^{-x^4} + c$

35. $\int \frac{e^{\sqrt{x}}}{\sqrt{x}}\,dx \qquad u = \sqrt{x} = x^{1/2}$

$du = \frac{1}{2}x^{-1/2}dx = \frac{1}{2\sqrt{x}}\,dx$

$2\int e^u\,du$

$= 2e^u + c = 2e^{\sqrt{x}} + c$

36. $\int \frac{e^{\frac{1}{x^2}}}{x^3}\,dx$

$u = \frac{1}{x^2} = x^{-2}$

$du = -2x^{-3}\,dx = \frac{-2}{x^3}\,dx$

$\frac{-1}{2}\int e^u\,du$

$= \frac{-1}{2}e^u + C$

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

37. $\int e^x\sqrt{1-e^x}\,dx$

$u = 1-e^x \quad du = -e^x\,dx$

$-\int u^{1/2}\,du$

$= -\frac{2}{3}u^{3/2} + C$

$= -\frac{2}{3}(1-e^x)^{3/2} + C$

38. $\int_{-1}^{2} 2^x\,dx = \int_{-1}^{2} e^{x\ln 2}\,dx$

$u = x\ln 2 \quad du = \ln 2\,dx$

$= \frac{1}{\ln 2}\int e^u\,du$

$= \frac{1}{\ln 2}\left[e^u\right] = \frac{1}{\ln 2}\left[2^x\right]_{-1}^{2}$

$= \frac{1}{\ln 2}\left[4 - \frac{1}{2}\right]$

39. $\int_{-2}^{0} (2)\,dx$

$2x\Big]_{-2}^{0}$

$(0) - (-4)$

$= 4$

40. $\int 2^{\sin x}\cdot\cos x\,dx$

$= \int e^{\sin x\ln 2}\cdot\cos x\,dx$

$u = \ln 2\cdot\sin x \quad dx$

$du = \ln 2\cos x$

$= \frac{1}{\ln 2}\int e^u\,du$

$= \frac{1}{\ln 2}\cdot 2^x + C$