15.1 $\int \frac{x^5+2x^3-4x^2-x+11}{x^2}dx = \int x^3 dx + \int 2x dx - \int 4 dx - \int x^{-1} dx + \int 11x^{-2} dx$

$= \frac{x^4}{4} + x^2 - 4x - \ln|x| - 11x^{-1} + C, \quad x \neq 0$ //

15.2 $\int \frac{(1-x)^2}{x\sqrt{x}}dx = \int x^{-\frac{3}{2}}dx - \int \frac{2\,dx}{\sqrt{x}} + \int \sqrt{x}\,dx =$

$= -\frac{2}{\sqrt{x}} - 4\sqrt{x} + \frac{2x\sqrt{x}}{3} + C = \frac{2x^2-12x-6}{3\sqrt{x}} + C$ //

15.3 $\int \frac{(1+x)^2}{x(1+x^2)}dx = \int \frac{1}{x} + \frac{2}{1+x^2}dx = \int \frac{1}{x}dx + \int \frac{2}{1+x^2}dx =$

$= \ln|x| + 2\,\mathrm{arctg}\,x + C, \quad x \neq 0$ //

15.4 $\int 2\cos^2\frac{x}{2}dx = 2\cdot\int \cos^2\frac{x}{2}dx \overset{\frac{x}{2}=t}{=} 2\cdot\int 2\cos^2 t\,dx =$

$= 4\int \frac{1+\cos 2t}{2}dt = 2\left(\int 1\,dt + \int \cos 2t\,dt\right) = 2\left(t + \frac{\sin 2t}{2}\right) =$

$= x + \sin(x) + C$ //

15.5 $\int(\cos 2x\cdot\sin x - \sin 2x\cos x)\,dx = \int \sin(-x)\,dx =$

$= \int -\sin x\,dx = -\int \sin x\,dx = -(-\cos x) + C = \cos x + C$ //

15.6 $\int tg^2 x\,dx = \int \frac{\sin^2 x}{\cos^2 x}dx = \int \frac{1-\cos^2 x}{\cos^2 x}dx = \int \frac{1}{\cos^2 x}dx - \int 1dx =$

$= tg\,x - x + C$ //

15.7 $\int sh\,x\cdot ch\,x\,dx = \frac{1}{4}\int sh\,2x\,dx = \frac{1}{4}ch\,x + C$ //

15.8 $\int \frac{3^{x+1}+e^{3x}-e^{x-1}}{e^x}dx = 3\int\left(\frac{3}{e}\right)^x dx + \int e^{2x}dx - \int \frac{1}{e}dx =$

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

15.9 $\int \frac{dx}{(2x-3)^5} = -\frac{1}{8(2x-3)^4} + C$ //

15.10 $\int \sqrt[3]{(5-8x)^4}\,dx = -\frac{3}{56}\sqrt[3]{(5-8x)^7} + C$ //

15.11 $\int e^{-3x+1}dx = -\frac{1}{3}e^{-3x+1} + C$ //

15.12 $\int \sin(2x-3)\,dx = -\frac{1}{2}\cos(2x-3) + C$ //

15.13 $\int \frac{dx}{2x^2+9} = \frac{1}{9}\int\frac{dx}{1+\frac{2}{9}x^2} = \frac{1}{3\sqrt{2}}\int\frac{dt}{1+t^2} = \frac{1}{3\sqrt{2}}\,arctg\frac{\sqrt{2}}{3}x + C$ //

15.14 $\int \frac{dx}{\sqrt{4-9x^2}} = \frac{1}{2}\int\frac{dx}{\sqrt{1-\frac{9}{4}x^2}} = \frac{1}{3}\int\frac{dx}{\sqrt{1-t^2}} = \frac{1}{3}\arcsin\frac{3x}{2} + C$ //

15.15 $\int_{x_0}^{x}\frac{t^3}{t^2-4}dt = \frac{1}{2}\int_{x_0}^{x}\frac{t^2}{t^2-4}dt^2 = |t^2 = y| = \frac{1}{2}\int_{x_0}^{x}\frac{y\,dy}{y-4} =$

$= \frac{1}{2}\int_{x_0}^{x}\frac{y-4+4}{y-4}dy = \frac{1}{2}\int_{x_0}^{x}dy + \frac{4}{2}\int_{x_0}^{x}\frac{dy}{y-4} = \frac{1}{2}y + 2\ln|y-4|\Big|_{x_0}^{x} =$

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

15.16 $\int_{x_0}^{x}\frac{t}{\sqrt{b^2t^2+a^2}}dt = \frac{1}{a}\int_{x_0}^{x}\frac{t}{\sqrt{\frac{b^2}{a^2}t^2+a^2}}dt = |y = \frac{b}{a}t| =$

$= \frac{1}{b}\int\frac{\frac{a}{b}y}{\sqrt{y^2+1}}dy = \frac{a}{b^2}\cdot\sqrt{y^2-1}\Big|_{x_0}^{x} = \frac{a}{b^2}\cdot\sqrt{\frac{b^2}{a^2}x^2+1} = \frac{1}{b^2}\cdot\sqrt{b^2x^2+a^2}$ //

15.17 $\int_{x_0}^{x} t^4 \sin(t^5+3)\,dt = \left| \begin{matrix} \sin(t^5+3) = \sin y \\ dy = 5t^4 dt \end{matrix} \right| =$

$= \frac{1}{5}\int \sin y\, dy = -\frac{\cos(x^5+3)}{5}$ //

15.18 $\int_{x_0}^{x} t\sqrt{b^2t^2+a^2}\,dt = \left| \begin{matrix} \sqrt{b^2t^2+a^2} = \sqrt{y} \\ dy = \frac{2t\,dt}{b^2} \end{matrix} \right| =$

$= \frac{1}{2b^2}\int_{x_0}^{x} \sqrt{y}\,dy = \frac{y\sqrt{y}}{3b^2} = \frac{(b^2x^2+a^2)^{\frac{3}{2}}}{3b^2}$ //

15.19 $\int_{x_0}^{x} \frac{1}{t^3} e^{-\frac{1}{t^2}}\,dt = \left| \begin{matrix} -\frac{1}{t^2} = y \\ 2t^{-3}dt = dy \end{matrix} \right| = \frac{1}{2}\int e^y\,dy =$

$= \frac{1}{2}e^y = \frac{1}{2}e^{-\frac{1}{x^2}}$ //

15.20 $\int_{x_0}^{x} e^{\sin t}\cos t\,dt = \left| \begin{matrix} \sin t = y \\ \cos t\,dt = dy \end{matrix} \right| = \int_{x_0}^{x} e^y\,dy =$

$= e^y = e^{\sin x}$ //

15.21 $\int_{x_0}^{x} \frac{dt}{t\ln t} = \left| \begin{matrix} \ln t = y \\ \frac{1}{t}dt = dy \end{matrix} \right| = \int_{x_0}^{x} \frac{dy}{y} = \ln|y| = \ln|\ln x|$

15.22 $\int_{x_0}^{x} \frac{dt}{t\ln t\ln\ln t} = \left| \begin{matrix} \ln t = y \\ \frac{1}{t}dt = dy \end{matrix} \right| = \int_{x_0}^{x} \frac{dy}{y\ln y} = \ln|\ln y| = \ln|\ln\ln x|$ //