$$\int \frac{(x^2-2)\,(x^2+2)}{3x^3}\,dx \qquad a^2-b^2=(a+b)(a-b)$$

$$\int \frac{(x^2)^2-(2)^2}{3x^3}\,dx = \int \frac{x^4-4}{3x^3}\,dx$$

$$= \int \frac{1}{3}\,\frac{x^4-4}{x^3}\,dx \quad \frac{1}{3}\cdot\left[\int \frac{x^4-4}{x^3}\,dx\right]$$

$$\frac{1}{3}\cdot\left[\int \frac{x^4}{x^3}\,dx - \int \frac{4}{x^3}\,dx\right] \qquad \frac{x^4}{x^3} \quad x^{4-3}=x$$

$$\int x^1\,dx - \int \frac{4}{x^3}\,dx \qquad x^1=x$$

$$\int x^n\,dx = \frac{x^{n+1}}{n+1}$$

$$\frac{1}{3}\cdot\left[\frac{x^{1+1}}{1+1} - \int \frac{4\cdot 1}{x^3}\,dx\right] = \frac{1}{3}\cdot\left[\frac{x^2}{2} - \int 4\,\frac{1}{x^3}\,dx\right]$$

$$\frac{1}{3}\cdot\left[\frac{x^2}{2} - 4\cdot\int \frac{1}{x^3}\,dx\right] \qquad \frac{1}{a}=a^{-1} \Leftrightarrow \frac{1}{x}=x^{-1}$$

$$\frac{1}{x^3}=(x^3)^{-1}$$

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

$$\frac{1}{3}\cdot\left[\frac{x^2}{2} - 4\int x^{-3}\,dx\right]$$

$$\frac{1}{3}\cdot\left[\frac{x^2}{2} - 4\cdot\frac{x^{-3+1}}{-3+1}\right] + C =$$

$$\frac{1}{3}\cdot\left[x^2 \cancel{-4}\cdot\frac{x^{-2}}{\cancel{-2}}\right] + C$$

$$\frac{1}{3}\cdot\left[x^2+2\cdot x^{-2}\right]+C$$

$$\int \frac{(e^x-1)\cdot(e^x+1)}{e^x}\,dx \qquad a^2-b^2=(a+b)(a-b)$$

$$\int \frac{(e^x)^2-(1)^2}{e^x}\,dx \qquad (e^x)^2=e^{2x} \qquad (1)^{100}=1$$

$$= \int \frac{e^{2x}-1}{e^x}\,dx = \int \frac{e^{2x}}{e^x}\,dx - \int \frac{1}{e^x}\,dx$$

$$\frac{e^{2x}}{e^x} = e^{2x-x} = e^x$$

$$\int e^x\,dx - \int \frac{1}{e^x}\,dx$$

$$e^x - \int \frac{1}{e^x}\,dx \qquad \frac{1}{a}=a^{-1} \qquad \frac{1}{e^x}=(e^x)^{-1}$$

$$e^x - \int (e^x)^{-1}\,dx = e^x - \int e^{-x}\,dx$$

$$\int e^{ax}\,dx = \frac{e^{ax}}{a}$$

$$= e^x - \int e^{-1x}\,dx = e^x \cancel{-}\frac{e^{-1x}}{\cancel{-}1} + C$$

$$= e^x + e^{-x} + C$$