$$\int_{-1}^{1} x\sqrt{1-x^2}\,dx = \int_{-1}^{1} \underbrace{(1-x^2)}\,^{\frac{1}{2}}\cdot x\cdot dx$$

$( )'$ $\quad -2x = (1-x^2)'$

$$= \frac{1}{-2}\int_{1}^{1}(1-x^2)^{\frac{1}{2}}\cdot(-2x)\cdot dx = -\frac{1}{2}\int_{-1}^{1}(1-x^2)^{\frac{1}{2}}\cdot\underbrace{(1-x^2)'}\cdot dx$$

$$\int T^{\frac{1}{2}}\,dT = \frac{1}{1+\frac{1}{2}}T^{1+\frac{1}{2}} = \frac{2}{3}T^{\frac{3}{2}}$$

$$= -\frac{1}{2}\cdot\left(\frac{2}{3}(1-x^2)^{\frac{3}{2}}\right)\Bigg|_{-1}^{1}$$

$$(u(v(x)))' = u'(v(x))\cdot v'(x)$$

$( )'$

$$\left(\frac{2}{3}(1-x^2)^{\frac{3}{2}}\right)' = \frac{\cancel{2}}{\cancel{3}}\cdot\frac{\cancel{3}}{\cancel{2}}\cdot(1-x^2)^{\frac{3}{2}-1}\cdot(1-x^2)'$$

$$(x^n)' = n\,x^{n-1}$$

$$= (1-x^2)^{\frac{1}{2}}\cdot(-2x)$$

$\int dx$

$$\left(\frac{2}{3}(1-x^2)^{\frac{3}{2}}\right)' = (1-x^2)^{\frac{1}{2}} \cdot (-2x)$$

$$(1-x^2)' = -2x$$

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

$$\left(\ln(x^2+2x-1)\right)' = \frac{1}{x^2+2x-1} \cdot \boxed{(x^2+2x-1)'}$$

$$u(v(x))$$

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

$$u(x) = \ln(x)$$

$$v(x) = \boxed{x^2+2x-1}$$

$$\int 5x\,dx = \frac{1}{5}\int (5x)^1 \cdot 5\,dx = \frac{1}{5}\int (5x)^1 \cdot (5x)'\,dx$$

$$= \frac{1}{5} \cdot \frac{1}{1+1} \cdot (5x)^{1+1} = \frac{1}{5} \cdot \frac{1}{2} \cdot (5x)^2$$

$$= \frac{1}{10} \cdot 25x^2 = \frac{5}{2}x^2$$

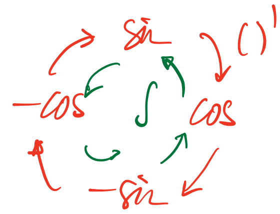
$$\int 5x\,dx = 5\boxed{\int x\,dx} = 5 \cdot \frac{1}{1+1} \cdot x^{1+1}$$

$$= \frac{5}{2}x^2$$

$$\int_a^b f(x)\,dx = \int_a^c f(x)\,dx + \int_c^b f(x)\,dx$$

$$\int_a^b f(x)\,dx = -\int_b^a f(x)\,dx$$

$$\int \left(-\cos(3x)\right) dx = -\frac{1}{3}\int \cos(3x)\cdot \underbrace{3}_{(3x)'}\, dx$$



$$= -\frac{1}{3}\cdot \sin(3x) + C$$

$f''(x) = 3x$ $\qquad$ $f'(x) = \frac{3}{2}x^2 + c$ $\qquad$ $\frac{3}{2}1^2 + c = 0 \;/\; c = -\frac{3}{2}$

$f'(1) = 0$ $\qquad$ $f(x) = \frac{3}{2}\cdot\frac{1}{3}\cdot x^3 + cx + d$

$f(2) = 1$ $\qquad$ $f(x) = \frac{1}{2}x^3 - \frac{3}{2}x + d$

$$\frac{1}{2}2^3 - \frac{3}{2}\cdot 2 + d = 1$$