

$$\int x^3 \sqrt{x^4 + 1} dx;$$

$$\begin{aligned} \int (x^3 \sqrt{x^4 + 1}) dx &= \int \sqrt{x^4 + 1} d(x^4)/4 = \frac{1}{4} \int \sqrt{x^4 + 1} d(x^4) = [x^4 = t] = \frac{1}{4} \int \sqrt{t + 1} dt = \\ &= \frac{1}{4} \int \sqrt{t + 1} d(t + 1) = [t + 1 = z] = \frac{1}{4} \int \sqrt{z} dz = \frac{1}{4} \int z^{1/2} dz = \frac{1}{4} \cdot 2z^{3/2} / \frac{3}{2} + C = z^{3/2} / 6 + C = \\ &= (t + 1)^{3/2} / 6 + C = (x^4 + 1)^{3/2} / 6 + C \end{aligned}$$

внесение под знак дифференциала

$$x^3 dx =$$

$$d(x^4) = 4x^3 dx$$

$$d(x^4)/4 = x^3 dx$$

пример

$$(x^5)' = 5x^4$$

$$d(x^5) = 5x^4 dx$$

$$dt = d(t + 1) = dt + d1 = dt + 0 \cdot dt = dt$$