edoceralph

Formel Potenzregel Integration:

$$\int (x^n)\,dx = \left(\frac{1}{n+1}\right) \cdot x^{n+1}$$

Aufgabe 1

$f(x) = x^2$

$n = 2 \quad => \quad F(x) = \frac{1}{3}x^3$

Aufgabe 2

$F(x) = 2 = 2x^0$

$n = 0 \quad => \quad F(x) = 2x$

Aufgabe 3

$f(x) = 8x^3$

$n = 3 \quad => \quad F(x) = 2x^4$

Aufgabe 4

$f(x) = 6x = 6x^1$

$n = 1 \quad => \quad F(x) = 3x^2$

Aufgabe 5

$f(x) = 200x^{99}$

$n = 99 \quad => \quad F(x) = 2x^{100}$

Aufgabe 6

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

$n = -3 \quad => \quad F(x) = \frac{1}{-2}x^{-2} = -\frac{1}{2}\frac{1}{x^2}$

Aufgabe 7

$f(x) = x^{-4}$

$n = -4 \Rightarrow F(x) = \frac{1}{-3}x^{-3} = -\frac{1}{3}\frac{1}{x^3}$

Aufgabe 8

$f(x) = \sqrt{x} = x^{\frac{1}{2}}$

$n = \frac{1}{2} \Rightarrow F(x) = \frac{1}{\frac{3}{2}}x^{\frac{3}{2}} = \frac{2}{3}x^{\frac{3}{2}} = \frac{2}{3}\sqrt[2]{x^3} = \frac{2}{3}\sqrt{x^3}$

Aufgabe 9

$f(x) = \sqrt[7]{x^4}$

$n = \frac{4}{7} \Rightarrow F(x) = \frac{1}{\frac{11}{7}}x^{\frac{11}{7}} = \frac{7}{11}x^{\frac{11}{7}} = \frac{7}{11}\sqrt[7]{x^{11}}$