$$D\left(7x^5 - \frac{4}{3}x^3 + 8x + 7\right)$$

$$= 7 \cdot 5x^4 - \frac{4}{3} \cdot 3 \cdot x^2 + 8 + 0$$

$$\int \left(7x^5 - \frac{4}{3}x^3 + 8x + 7\right) dx$$

$$7 \cdot \frac{1}{6} \cdot x^6 - \frac{4}{3} \cdot \frac{1}{4} x^4 + 8 \cdot \frac{1}{2} \cdot x^2 + 7x + C$$

$$\int k \, dx = kx + C$$

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

$$r \neq -1$$

$$a^{\frac{m}{n}} = \sqrt[n]{a^m}$$

$$\int x^r \, dx = \frac{1}{r+1} \cdot x^{r+1} + C$$

223. a) $\int \sqrt[3]{x} \, dx \quad , x > 0$

$$= \int x^{\frac{1}{3}} \, dx = \frac{3}{4} \cdot x^{\frac{4}{3}} + C$$

$$= \frac{3}{4} \cdot \sqrt[3]{x^4} + C = \frac{3}{4} x \sqrt[3]{x} + C$$

b) $\int \frac{2}{\sqrt{x}} \, dx \quad , x > 0$

$$2 \cdot \int x^{-\frac{1}{2}} \, dx = 2 \cdot \frac{2}{1} x^{\frac{1}{2}} + C = 4\sqrt{x} + C$$

c) $$\int \left(\frac{1}{1-\sqrt{x}} + \frac{1}{1+\sqrt{x}} - \frac{2x}{1-x} \right) dx$$

$1 - x = (1-\sqrt{x})(1+\sqrt{x})$

$(a^2 - b)^2 = (a-b)(a+b)$

Laventetaan samannimisiksi:

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

$$= \int \left(\frac{1+\sqrt{x} + 1 - \sqrt{x} - 2x}{1-x} \right) dx$$

$$= \int \frac{2-2x}{1-x} dx = \int \frac{2\cancel{(1-x)}}{\cancel{1-x}} dx = \int 2\, dx = 2x + C$$

228. $F(x) = \int x^{\pi} \, dx = \frac{1}{\pi+1} x^{\pi+1} + C$

$F(1) = \frac{\pi^2}{\pi+1}$:

$$\boxed{\int x^r \, dx = \frac{1}{r+1} x^{r+1} + C}$$

$r \neq -1$

$\frac{1}{\pi+1} \cdot 1^{\pi+1} + C = \frac{\pi^2}{\pi+1}$ s. 17

$\frac{1}{\pi+1} + C = \frac{\pi^2}{\pi+1} \quad \Big| : (\pi+1)$

$1 + C \cdot (\pi+1) = \pi^2$ V: $F(x) = \frac{1}{\pi+1} x^{\pi+1} + \pi - 1$

$C = \frac{\pi^2 - 1}{\pi+1} = \frac{(\pi-1)\cancel{(\pi+1)}}{\cancel{\pi+1}}$

$$\int (x+1)^2\,dx = \int (x^2+2x+1)\,dx$$

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