

Themen 7.

$$9.) \int_1^2 x^3 dx$$

$$F(x) = \int x^3 dx = \frac{x^{3+1}}{3+1} = \frac{x^4}{4}$$

$$\int_1^2 x^3 dx = \left[\frac{x^4}{4} \right]_1^2 = f(2) - f(1)$$

$$F(2) = \frac{2^4}{4} = \frac{16}{4} = 4$$

$$F(1) = \frac{1^4}{4} = \frac{1}{4} = 0,25$$

$$\int_1^2 x^3 dx = 4 - 0,25 = 3,75 \text{ Ombem: D) } 3,75$$

$$10.) \int_{\pi/4}^{\pi/2} \cos 2x dx$$

$$F(x) = \int \cos 2x dx$$

$$F(x) = \frac{1}{2} \int \cos u du = \frac{1}{2} \sin u = \frac{1}{2} \sin 2x$$

$$\int_{\pi/4}^{\pi/2} \cos 2x dx = \left[\frac{1}{2} \sin 2x \right]_{\pi/4}^{\pi/2} = F(\frac{\pi}{2}) - f(\frac{\pi}{4})$$

$$F(\frac{\pi}{2}) = \frac{1}{2} \sin \left(2 \cdot \frac{\pi}{2} \right) = \frac{1}{2} \sin \pi = \frac{1}{2} \cdot 0 = 0$$

$$f(\frac{\pi}{4}) = \frac{1}{2} \sin \left(2 \cdot \frac{\pi}{4} \right) = \frac{1}{2} \sin \frac{\pi}{2} = \frac{1}{2} \cdot 1 = 0,5$$

$$\int_{\pi/4}^{\pi/2} \cos 2x dx = 0 - 0,5 = -0,5 \text{ Ombem: t) } -0,5$$

$$11) \int_{-\pi}^{2\pi} \sin \frac{x}{4} dx$$

$$\int_{-\pi}^{2\pi} \sin \frac{x}{4} dx = \left[-4 \cos \frac{x}{4} \right]_{-\pi}^{2\pi} = f(2\pi) - f(-\pi)$$

$$f(2\pi) = -4 \cos \left(\frac{2\pi}{4} \right) = -4 \cos \left(\frac{\pi}{2} \right) = -4 \cdot 0 = 0$$

$$f(-\pi) = -4 \cos \left(\frac{-\pi}{4} \right)$$

$$\int_{-\pi}^{2\pi} \sin \frac{x}{4} dx = 0 - (-2\sqrt{2}) = 2\sqrt{2} \quad \text{Umform: } D) 2\sqrt{2}$$

$$12) \int_0^{\pi} \frac{dx}{\cos^2 \frac{x}{3}}$$

$$F(x) = \int_0^{\pi/3} \frac{dx}{\cos^2 \frac{x}{3}} = \left[3 \tan \frac{x}{3} \right]$$

$$\int_0^{\pi} \frac{dx}{\cos^2 \frac{x}{3}} = \left[3 \tan \frac{x}{3} \right]_0^{\pi} = f(\pi) - f(0)$$

$$\int_0^{\pi} \frac{dx}{\cos^2 \frac{x}{3}} = 3\sqrt{3} - 0 = 3\sqrt{3} \quad \text{Umform: } Q) 3\sqrt{3}$$

$$9. \int_1^2 x^4 dx$$

$$\int_1^2 x^4 dx = \left[\frac{x^5}{5} \right]_1^2 = \frac{2^5}{5} - \frac{1^5}{5} = \frac{32}{5} - \frac{1}{5} = \frac{31}{5} = 6.2$$

Umform: D) 6.2