

Integreren Oefening 1 Antwoorden

1.
$$\int_0^3 (4x^2 - x^3) dx = \left[\frac{4}{3}x^3 - \frac{1}{4}x^4 \right]_{x=0}^{x=3} = 15,75$$
2.
$$\int_4^9 \frac{2x-4}{\sqrt{x}} dx = \left[\frac{4}{3}x^{1\frac{1}{2}} - 8x^{\frac{1}{2}} \right]_4^9 =$$
3.
$$\int_0^{2\pi} \sin 2x dx = \left[-\frac{1}{2} \cos 2x \right]_0^{2\pi} = 0$$
4.
$$\int_0^4 (4-2x)^2 dx = \left[-\frac{1}{6} \cdot (4-2x)^3 \right]_0^4 =$$
5.
$$\int \cos(3x-1) dx = \frac{1}{3} \sin(3x-1) + c$$
6.
$$\int (1+2 \sin 3x) dx = x - \frac{2}{3} \cos 3x + c$$
7.
$$\int x\sqrt{x} dx = \frac{2}{5} x^2 \sqrt{x} + c$$
8.
$$\int \frac{5}{x^2} dx = -5x^{-1} + c$$
9.
$$\int \frac{2}{x^4} dx = -\frac{2}{3} x^{-3} + c$$
10.
$$\int_0^{\pi} \cos^7 x \cdot \sin x dx = \left[-\frac{1}{8} \cos^8 x \right]_0^{\pi} = 0,25$$
11.
$$\int_1^2 (x^2 - 3)^5 \cdot 2x dx = \left[\frac{1}{6} (x^2 - 3)^6 \right]_1^2 = -10,5$$
12.
$$\int_2^4 \left(\frac{2}{x^2} - \sqrt{x} \right) dx = \int_2^4 (2x^{-2} - x^{0,5}) dx = \left[-2x^{-1} - \frac{2}{3} x^{1,5} \right]_2^4 =$$

$$-2 \cdot \frac{1}{4} - \frac{2}{3} \cdot 4 \cdot \sqrt{4} + 2 \cdot \frac{1}{2} + \frac{2}{3} \cdot 2 \cdot \sqrt{2} = -\frac{1}{2} - \frac{16}{3} + 1 + \frac{4}{3} \sqrt{2} = \frac{4}{3} \sqrt{2} - \frac{29}{6}$$
13.
$$\int_0^{10} (x-2)^2 dx = \left[\frac{1}{3} (x-2)^3 \right]_0^{10} = \frac{1}{3} \cdot 8^3 - \frac{1}{3} \cdot (-2)^3 = \frac{512}{3} + \frac{8}{3} = 173\frac{1}{3}$$
14.
$$\int_2^4 \left(\frac{2}{\sqrt{x}} - \sqrt{x} \right) dx = \int_2^4 (2x^{-\frac{1}{2}} - x^{\frac{1}{2}}) dx = \left[2 \cdot 2x^{\frac{1}{2}} - \frac{2}{3} x^{\frac{3}{2}} \right]_2^4 =$$

$$4\sqrt{4} - \frac{2}{3} \cdot 4\sqrt{4} - (4\sqrt{2} - \frac{2}{3} \cdot 2\sqrt{2}) = 8 - 5\frac{1}{3} - 2\frac{2}{3}\sqrt{2} = 2\frac{2}{3} - 2\frac{2}{3}\sqrt{2}$$
15.
$$\int_0^{10} (x^2 - 3)^2 dx = \int_0^{10} (x^4 - 6x^2 + 9) dx =$$

$$\left[\frac{1}{5} x^5 - 6 \cdot \frac{1}{3} x^3 + 9x \right]_0^{10} = (20000 - 2000 + 90) - 0 = 18090$$

$$16 \quad \int_1^2 \frac{dx}{x^2} = \left[\frac{-1}{x} \right]_1^2 = \frac{1}{2}$$

$$17 \quad \int_0^{\ln 3} e^{-x} dx = [e^{-x}]_0^{\ln 3} = \frac{2}{3}$$

$$18 \quad \int_6^9 \sqrt{x-5} dx = \left[\frac{2}{3} (x-5)^{\frac{3}{2}} \right]_6^9 = 4 \frac{2}{3}$$

$$19 \quad \int_0^{\sqrt{2}} x \sqrt{2x^2} dx = \left[\frac{2}{3} (2x^2)^{\frac{3}{2}} \cdot \frac{1}{4} \right]_0^{\sqrt{2}} = 1 \frac{1}{3}$$

$$20 \quad \int_0^1 \frac{2x}{x^2+1} dx = [\ln|x^2+1|]_0^1 = \ln 2$$