

x_i	p_i
0	$0,1^4$
1	$0,9 \cdot 0,1 \cdot 0,1 \cdot 0,1 \cdot 0,1 \cdot 4$
2	$0,9 \cdot 0,9 \cdot 0,1 \cdot 0,1 \cdot \binom{4}{2}$
3	$0,9 \cdot 0,9 \cdot 0,9 \cdot 0,1 \cdot 4$
4	$0,9 \cdot 0,9 \cdot 0,9 \cdot 0,9$
	$\Sigma = 1 \%$

$$\left. \begin{array}{l} 00EE \\ 0E0E \\ 0EE0 \\ E00E \\ E0E0 \\ EE00 \end{array} \right\} \begin{array}{c} \boxed{\text{||||}} \\ \binom{4}{2} = 6 \end{array}$$

$$E(X) = \sum x_i p_i = 0 \cdot 0,1^4 + 1 \cdot 0,9 \cdot 0,1^3 \cdot 4 + \dots + 4 \cdot 0,9^4 = 3,6$$

Γ_{TA1} : Teitelboe $\Rightarrow X \sim \text{Bin}(4; 0,9)$

$$\Rightarrow E(X) = \mu_p = 4 \cdot 0,9 = 3,6 \quad \text{J}$$

13. Integrierte

$$D x^m = m x^{m-1}$$

$$D e^x = e^x$$

$$D e^{f(x)} = e^{f(x)} \cdot f'(x)$$

$$D \sin x = \cos x$$

$$D \sin f(x) = \cos f(x) \cdot f'(x)$$

$$D \cos x = -\sin x$$

$$D \cos f(x) = -\sin f(x) \cdot f'(x)$$

$$D (f(x))^m = m (f(x))^{m-1} \cdot f'(x)$$

$$D \ln|x| = \frac{1}{x}$$

$$D \ln|f(x)| = \frac{1}{f(x)} \cdot f'(x) = \frac{f'(x)}{f(x)}$$

$$13.1 \quad a) \int (6x^2 - x) dx = 6 \cdot \frac{1}{3} x^3 - \frac{1}{2} x^2 + C = 2x^3 - \frac{1}{2} x^2 + C$$

$$b) \int \left(\frac{1}{\sqrt{x}} + \frac{1}{3x} \right) dx = \int \left(x^{-\frac{1}{2}} + \frac{1}{3} \cdot \frac{1}{x} \right) dx = \left(\frac{1}{\frac{1}{2}} x^{\frac{1}{2}} + \frac{1}{3} \ln|x| \right) + C$$

$$= 2\sqrt{x} + \frac{1}{3} \ln|x| + C$$

$$c) \int \left(2e^x - \frac{\sin x}{4} \right) dx = \int \left(2 \cdot e^x - \frac{1}{4} \sin x \right) dx$$

$$= 2e^x - \frac{1}{4} (-\cos x) + C = 2e^x + \frac{1}{4} \cos x + C$$

$$13.7 \quad a) \int_0^1 (\sqrt{x} + 1) dx = \int_0^1 \left(x^{\frac{1}{2}} + 1 \right) dx = \left[\frac{2}{3} x^{\frac{3}{2}} + x \right]_0^1 = \left(\frac{2}{3} \cdot 1^{\frac{3}{2}} + 1 \right) - \left(\frac{2}{3} \cdot 0^{\frac{3}{2}} + 0 \right)$$

$$= \frac{2}{3} + 1 = \frac{2}{3} + \frac{3}{3} = \frac{5}{3}$$