

**Aufgabe 1:**

$$\begin{aligned} \text{a) } f(x) &= x^{15} \\ f'(x) &= 15x^{14} \end{aligned}$$

$$\begin{aligned} \text{b) } f(x) &= x^{17} \\ f'(x) &= 17x^{16} \end{aligned}$$

$$\begin{aligned} \text{c) } f(x) &= x^9 \\ f'(x) &= 9x^8 \end{aligned}$$

**Aufgabe 2:**

$$\begin{aligned} \text{a) } f(x) &= 7.2x^5 \\ f'(x) &= 36.0x^4 \end{aligned}$$

$$\begin{aligned} \text{b) } f(x) &= -3.1x^8 \\ f'(x) &= -24.8x^7 \end{aligned}$$

$$\begin{aligned} \text{c) } f(x) &= 7.3x^{14} \\ f'(x) &= 102.2x^{13} \end{aligned}$$

**Aufgabe 3:**

$$\begin{aligned} \text{a) } f(x) &= 5x^{15} - 15x^4 \\ f'(x) &= 75x^{14} - 60x^3 \end{aligned}$$

$$\begin{aligned} \text{b) } f(x) &= -19x^{14} \\ f'(x) &= -266x^{13} \end{aligned}$$

$$\begin{aligned} \text{c) } f(x) &= -17x^9 + 2x^8 \\ f'(x) &= -153x^8 + 16x^7 \end{aligned}$$

**Aufgabe 4:**

$$\begin{aligned} \text{a) } f(x) &= -\frac{13}{x^{14}} \\ f'(x) &= \frac{182}{x^{15}} \end{aligned}$$

$$\begin{aligned} \text{b) } f(x) &= -\frac{14}{x^{17}} \\ f'(x) &= \frac{238}{x^{18}} \end{aligned}$$

$$\begin{aligned} \text{c) } f(x) &= -\frac{15}{x^5} \\ f'(x) &= \frac{75}{x^6} \end{aligned}$$

**Aufgabe 5:**

$$\begin{aligned} \text{a) } f(x) &= 3\sqrt{\frac{1}{x^5}} \\ f'(x) &= -15\sqrt{\frac{1}{x^5}}/2x \end{aligned}$$

$$\begin{aligned} \text{b) } f(x) &= -8\sqrt{x} \\ f'(x) &= -4/\sqrt{x} \end{aligned}$$

$$\begin{aligned} \text{c) } f(x) &= 19\sqrt{\frac{1}{x^4}} \\ f'(x) &= -38\sqrt{\frac{1}{x^4}}/x \end{aligned}$$

**Aufgabe 6:**

$$\begin{aligned} \text{a) } 2x + 1 &= 5 \\ [2] \end{aligned}$$

$$\begin{aligned} \text{b) } 4x + 5 &= 0 \\ [-\frac{5}{4}] \end{aligned}$$

$$\begin{aligned} \text{c) } -3x - 1 &= -2 \\ [\frac{1}{3}] \end{aligned}$$

**Aufgabe 7:**

$$\begin{aligned} \text{a) } -3x^2 - 4x - 1 &= 0 \\ [-1, -\frac{1}{3}] \end{aligned}$$

$$\begin{aligned} \text{b) } -4x^2 + 2 &= 0 \\ [-\sqrt{2}/2, \sqrt{2}/2] \end{aligned}$$

$$\begin{aligned} \text{c) } x^2 + 4x + 3 &= 0 \\ [-3, -1] \end{aligned}$$