

## Potenzregel

### Lösungen:

Funktion	1. Ableitung
$f(x) = x^5$	$f'(x) = 5x^4$
$g(x) = x^{-5}$	$g'(x) = -5x^{-6} = -\frac{5}{x^6}$
$h(x) = \frac{1}{x^3} = x^{-3}$	$h'(x) = -3x^{-4} = -\frac{3}{x^4}$
$f(x) = \frac{1}{x} = x^{-1}$	$f'(x) = -x^{-2} = -\frac{1}{x^2}$
$f(x) = \frac{1}{x^{10}} = x^{-10}$	$f'(x) = -10x^{-11} = -\frac{10}{x^{11}}$
$f(x) = \sqrt[4]{x} = x^{\frac{1}{4}}$	$f'(x) = \frac{1}{4}x^{-\frac{3}{4}} = \frac{1}{4} \cdot \frac{1}{\sqrt[4]{x^3}}$
$f(x) = \sqrt[5]{x} = x^{\frac{1}{5}}$	$f'(x) = \frac{1}{5}x^{-\frac{4}{5}} = \frac{1}{5} \cdot \frac{1}{\sqrt[5]{x^4}}$
$f(x) = \sqrt{x^7} = x^{\frac{7}{2}}$	$f'(x) = \frac{7}{2}x^{\frac{5}{2}} = \frac{7}{2} \cdot \sqrt{x^5}$
$f(x) = \sqrt[7]{x} = x^{\frac{1}{7}}$	$f'(x) = \frac{1}{7}x^{-\frac{6}{7}} = \frac{1}{7} \cdot \frac{1}{\sqrt[7]{x^6}}$
$f(x) = \sqrt[3]{x^4} = x^{\frac{4}{3}}$	$f'(x) = \frac{4}{3}x^{\frac{1}{3}} = \frac{4}{3} \cdot \sqrt[3]{x}$
$f(x) = \sqrt[4]{x^5} = x^{\frac{5}{4}}$	$f'(x) = \frac{5}{4}x^{\frac{1}{4}} = \frac{5}{4} \cdot \sqrt[4]{x}$
$f(x) = \frac{1}{\sqrt{x}} = x^{-\frac{1}{2}}$	$f'(x) = -\frac{1}{2}x^{-\frac{3}{2}} = -\frac{1}{2} \cdot \frac{1}{\sqrt{x^3}}$
$f(t) = t^s$	$f'(s) = s \cdot t^{s-1}$
$f(x) = \sqrt[10]{x^7} = x^{\frac{10}{7}}$	$f'(x) = \frac{10}{7}x^{\frac{3}{7}} = \frac{10}{7} \cdot \sqrt[7]{x^3}$
$f(x) = \frac{1}{\sqrt[10]{x^7}} = x^{-\frac{10}{7}}$	$f'(x) = -\frac{10}{7}x^{-\frac{17}{7}} = -\frac{10}{7} \cdot \frac{1}{\sqrt[7]{x^{17}}}$
$f(a) = \sqrt[n]{a} = a^{\frac{1}{n}}$	$f'(x) = \frac{1}{n} \cdot a^{\frac{1}{n}-1}$
$f(x) = x^{19}$	$f'(x) = 19x^{18}$
$f(x) = \frac{1}{x^{20}} = x^{-20}$	$f'(x) = -20 \cdot \frac{1}{x^{21}}$
$f(x) = \sqrt[10]{x}$	$f'(x) = \frac{1}{10}x^{-\frac{9}{10}}$
$f(x) = \frac{x}{x^7} = x^{-6}$	$f'(x) = -6x^{-7}$