Differentialkvotient for $f(x) = a^x$

Differentialkvotient for $f(x) = a^x$, hvor $a > 0$.

$$a^x = e^{\ln(a^x)}$$

f	f'	
k	0	(1)
$k \cdot x$	k	(2)
x^n	$n \cdot x^{n-1}$	(3)
$\frac{1}{x}$	$-\frac{1}{x^2}$	(4)
$\sqrt{x}$	$\frac{1}{2\sqrt{x}}$	(5)
e^x	e^x	(6)
$e^{k \cdot x}$	$k \cdot e^x$	(7)
$\ln(x)$	$\frac{1}{x}$	(8)
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Anvendelse af regneregler

Bestem f' for følgende funktioner.

Brug den beviste regneregel

$$f(x) = 2^x$$
$$f(x) = 0{,}5^x$$
$$f(x) = \left(\frac{2}{3}\right)^x$$

f	f'	
k	0	(1)
$k \cdot x$	k	(2)
x^n	$n \cdot x^{n-1}$	(3)
$\frac{1}{x}$	$-\frac{1}{x^2}$	(4)
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a^x	$a^x \cdot \ln(a)$	(9)

Anvendelse af regneregler

Bestem f' for følgende funktioner.

Brug den beviste regneregel

$$f(x) = 2^x \Rightarrow f'(x) = \ln(2) \cdot 2^x$$

$$f(x) = 0{,}5^x$$

$$f(x) = \left(\frac{2}{3}\right)^x$$

f	f'	
k	0	(1)
$k \cdot x$	k	(2)
x^n	$n \cdot x^{n-1}$	(3)
$\frac{1}{x}$	$-\frac{1}{x^2}$	(4)
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$$f(x) = 0{,}5^x \Rightarrow f'(x) = \ln(0{,}5) \cdot 0{,}5^x$$
$$f(x) = \left(\frac{2}{3}\right)^x \Rightarrow f'(x) = \ln(\tfrac{2}{3}) \left(\frac{2}{3}\right)^x$$

f	f'	
k	0	(1)
$k \cdot x$	k	(2)
x^n	$n \cdot x^{n-1}$	(3)
$\frac{1}{x}$	$-\frac{1}{x^2}$	(4)
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