

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

Differentialkvotient for $f(x) = x^n$, hvor n er et tal.

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

f	f'	
$g + h$	$g' + h'$	(10)
$k \cdot g(x)$	$k \cdot g'(x)$	(11)
$g \cdot h$	$g' \cdot h + g \cdot h'$	(12)
$\frac{1}{g}$	$-\frac{g'}{g^2}$	(13)
$\frac{h}{g}$	$\frac{h' \cdot g - h \cdot g'}{g^2}$	(14)
$g(h(x))$	$g'(h(x)) \cdot h'(x)$	(15)

f	f'	
k	0	(1)
$k \cdot x$	k	(2)
		(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)
		(9)

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$$\begin{aligned} x^n &= e^{\ln(x^n)} \\ x^n &= e^{n \cdot \ln(x)} \end{aligned} \qquad \ln(a^b) = b \cdot \ln(a)$$

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$$x^n = e^{n \cdot \ln(x)} \quad \ln(a^b) = b \cdot \ln(a)$$
$$(x^n)' = n \cdot e^{n \cdot \ln(x)} \cdot \frac{1}{x}$$

f	f'	
$g + h$	$g' + h'$	(10)
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Differentialkvotient for $f(x) = x^n$, hvor n er et tal.

$$(x^n)' = n \cdot \frac{x^n}{x}$$
$$(x^n)' = n \cdot x^{n-1}$$

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		(9)

Anvendelse af regneregler

Bestem f' for følgende funktioner.

Brug den beviste regneregler

$$f(x) = x^4$$

$$f(x) = x^2$$

$$f(x) = x$$

$$f(x) = x^{2.8}$$

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)
		(9)

Anvendelse af regneregler

Bestem f' for følgende funktioner.

Brug den beviste regneregler

$$f(x) = x^4 \Rightarrow f'(x) = 4x^{4-1}$$

$$f(x) = x^2$$

$$f(x) = x$$

$$f(x) = x^{2.8}$$

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)
		(9)

Anvendelse af regneregler

Bestem f' for følgende funktioner.

Brug den beviste regneregler

$$f(x) = x^4 \Rightarrow f'(x) = 4x^3$$

$$f(x) = x^2$$

$$f(x) = x$$

$$f(x) = x^{2.8}$$

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 regneregler

$$f(x) = x^4 \Rightarrow f'(x) = 4x^3$$

$$f(x) = x^2 \Rightarrow f'(x) = 2x^{2-1}$$

$$f(x) = x$$

$$f(x) = x^{2.8}$$

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)
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$\ln(x)$	$\frac{1}{x}$	(8)
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Brug den beviste regneregler

$$f(x) = x^4 \Rightarrow f'(x) = 4x^3$$

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

$$f(x) = x$$

$$f(x) = x^{2.8}$$

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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Anvendelse af regneregler

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Brug den beviste regneregler

$$f(x) = x^4 \Rightarrow f'(x) = 4x^3$$

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

$$f(x) = x \Rightarrow f'(x) = 1x^{1-1}$$

$$f(x) = x^{2.8}$$

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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$\ln(x)$	$\frac{1}{x}$	(8)
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Anvendelse af regneregler

Bestem f' for følgende funktioner.

Brug den beviste regneregler

$$f(x) = x^4 \Rightarrow f'(x) = 4x^3$$

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

$$f(x) = x \Rightarrow f'(x) = 1$$

$$f(x) = x^{2.8}$$

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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$$f(x) = x^4 \Rightarrow f'(x) = 4x^3$$

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

$$f(x) = x \Rightarrow f'(x) = 1$$

$$f(x) = x^{2.8} \Rightarrow f'(x) = 2.8x^{2.8-1}$$

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)
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$$f(x) = x^4 \Rightarrow f'(x) = 4x^3$$

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

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$$f(x) = x^{2.8} \Rightarrow f'(x) = 2.8x^{1.8}$$

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k	0	(1)
$k \cdot x$	k	(2)
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