Derivacija realne funkcije realne varijable

Matematika za ekonomiste 1

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petnaesti zadatak

šesnaesti zadatak

prvi zadatak

Odredite derivacije funkcija
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drugi zadatak —

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$$= \frac{3}{5} \cdot (x^3)' - \frac{7}{5} \cdot (x^2)' + \frac{9}{5} \cdot (x)' + 0 =$$

$$= \frac{3}{5} \cdot 3x^2$$

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$$(u+v)'(x) = u'(x) + v'(x) \qquad (u-v)'(x) = u'(x) - v'(x)$$

$$(x)'(y) = u'(y) = v'(y)$$

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$$= \frac{3}{5} \cdot 3x^2 - \frac{7}{5} \cdot 2x$$

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$$= \frac{3}{5} \cdot 3x^2 - \frac{7}{5} \cdot 2x + \frac{9}{5} \cdot 1$$

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$$= \frac{3}{5} \cdot 3x^2 - \frac{7}{5} \cdot 2x + \frac{9}{5} \cdot 1 = \frac{9}{5}x^2 - \frac{14}{5}x + \frac{9}{5}$$

$$(cu)'(x) = c \cdot u'(x)$$

$$(c)' = 0$$

$$(x^n)' = nx^{n-1}$$

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treći zadatak

Odredite derivaciju funkcije
$$y = \frac{4x^2}{3\sqrt[7]{x^4}}$$
.



Odredite derivaciju funkcije $y = \frac{4x^2}{3\sqrt[7]{x^4}}$.

$$y = \frac{4x^2}{3\sqrt[7]{x^4}}$$

$$\frac{x^n}{x^m} = x^{n-m}$$

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$$\left| \frac{x^n}{x^m} = x^{n-m} \right| \left[\sqrt[n]{x^m} = x^{\frac{m}{n}} \right]$$

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$$\frac{x^n}{x^m} = x^{n-m}$$

$$\sqrt[n]{x^m} = x^{\frac{m}{n}}$$

Odredite derivaciju funkcije
$$y = \frac{4x^2}{3\sqrt[7]{x^4}}$$
.

$$(cu)'(x) = c \cdot u'(x)$$

$$(x^n)' = nx^{n-1}$$

$$y = \frac{4x^2}{3\sqrt[7]{x^4}} = \frac{4x^2}{3x^{\frac{4}{7}}} = \frac{4}{3}x^{2-\frac{4}{7}}$$
$$y = \frac{4}{3}x^{\frac{10}{7}}$$
$$y' = \frac{4}{3} \cdot \left(x^{\frac{10}{7}}\right)'$$

$$\frac{x^n}{x^m} = x^{n-m}$$

 $\sqrt[n]{x^m} = x^{\frac{m}{n}}$

Odredite derivaciju funkcije
$$y = \frac{4x^2}{3\sqrt[7]{x^4}}$$
.

$$cu)'(x) = c \cdot u'(x)$$

$$(x^n)'=nx^{n-1}$$

$$y = \frac{4x^2}{3\sqrt[7]{x^4}} = \frac{4x^2}{3x^{\frac{4}{7}}} = \frac{4}{3}x^{2-\frac{4}{7}}$$
$$y = \frac{4}{3}x^{\frac{10}{7}}$$
$$y' = \frac{4}{3} \cdot \left(x^{\frac{10}{7}}\right)' = \frac{4}{3}.$$

$$\frac{x^n}{x^m} = x^{n-m}$$

$$\sqrt[n]{x^m} = x^{\frac{m}{n}}$$

Odredite derivaciju funkcije
$$y = \frac{4x^2}{3\sqrt[7]{x^4}}$$
.

$$(cu)'(x) = c \cdot u'(x)$$

$$(x^n)'=nx^{n-1}$$

$$y = \frac{4x^2}{3\sqrt[7]{x^4}} = \frac{4x^2}{3x^{\frac{4}{7}}} = \frac{4}{3}x^{2-\frac{4}{7}}$$
$$y = \frac{4}{3}x^{\frac{10}{7}}$$
$$y' = \frac{4}{3} \cdot \left(x^{\frac{10}{7}}\right)' = \frac{4}{3} \cdot \frac{10}{7}x^{\frac{10}{7}-1}$$

$$\frac{x^n}{x^m} = x^{n-m}$$

 $\sqrt[n]{x^m} = x^{\frac{m}{n}}$

Odredite derivaciju funkcije $y = \frac{4x^2}{3\sqrt[7]{x^4}}$.

 $(cu)'(x) = c \cdot u'(x)$

$$y = \frac{4x^2}{3\sqrt[7]{x^4}} = \frac{4x^2}{3x^{\frac{4}{7}}} = \frac{4}{3}x^{2-\frac{4}{7}}$$

$$y = \frac{4}{3}x^{\frac{10}{7}}$$

$$y' = \frac{4}{3} \cdot \left(x^{\frac{10}{7}}\right)' = \frac{4}{3} \cdot \frac{10}{7}x^{\frac{10}{7} - 1}$$

$$y' = \frac{40}{21}x^{\frac{3}{7}}$$

$$\boxed{\frac{x^n}{x^m} = x^{n-m}} \boxed{\sqrt[n]{x^m} = x^{\frac{m}{n}}}$$

Odredite derivaciju funkcije $y = \frac{4x^2}{3\sqrt[3]{\sqrt{4}}}$.

 $(cu)'(x) = c \cdot u'(x)$

$$\sqrt{2-\frac{4}{7}}$$

$$y = \frac{4x^2}{3\sqrt[7]{x^4}} = \frac{4x^2}{3x^{\frac{4}{7}}} = \frac{4}{3}x^{2-\frac{4}{7}}$$

$$y = \frac{4}{3}x^{\frac{10}{7}}$$

$$y' = \frac{4}{3} \cdot \left(x^{\frac{10}{7}}\right)' = \frac{4}{3} \cdot \frac{10}{7}x^{\frac{10}{7}-1}$$

$$y' = \frac{40}{21}x^{\frac{3}{7}} = \frac{40}{21}\sqrt[7]{x^3}$$

četvrti zadatak

Odredite derivaciju funkcije $y = xe^x$ u točki 0.

$$(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)$$

Odredite derivaciju funkcije $y = xe^x$ u točki 0.

$$y' =$$

$$(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)$$

Odredite derivaciju funkcije $y = xe^x$ u točki 0.

$$y' = (x)'$$

$$(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)$$

Odredite derivaciju funkcije $y = xe^x$ u točki 0.

$$y'=\left(x\right) '\cdot$$

$$(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)$$

Odredite derivaciju funkcije $y = xe^x$ u točki 0.

$$y' = (x)' \cdot e^x$$

$$(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)$$

Odredite derivaciju funkcije $y = xe^x$ u točki 0.

$$y' = (x)' \cdot e^x +$$

$$(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)$$

Odredite derivaciju funkcije $y = xe^x$ u točki 0.

$$y' = (x)' \cdot e^x + x$$

$$(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)$$

Odredite derivaciju funkcije $y = xe^x$ u točki 0.

$$y' = (x)' \cdot e^x + x \cdot$$

$$(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)$$

Odredite derivaciju funkcije $y = xe^x$ u točki 0.

$$y' = (x)' \cdot e^x + x \cdot (e^x)'$$

$$(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)$$
 $(x^n)' = nx^{n-1}$

Odredite derivaciju funkcije $y = xe^x$ u točki 0.

$$y' = (x)' \cdot e^{x} + x \cdot (e^{x})'$$
$$y' = 1$$

$$(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)$$
 $(x^n)' = nx^{n-1}$

Odredite derivaciju funkcije $y = xe^x$ u točki 0.

$$y' = (x)' \cdot e^{x} + x \cdot (e^{x})'$$
$$y' = 1 \cdot e^{x}$$

$$(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)$$
 $(x^n)' = nx^{n-1}$

Odredite derivaciju funkcije $y = xe^x$ u točki 0.

$$y' = (x)' \cdot e^{x} + x \cdot (e^{x})'$$
$$y' = 1 \cdot e^{x} + x \cdot (e^{x})'$$

$$(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)$$
 $(x^n)' = nx^{n-1}$

Odredite derivaciju funkcije $y = xe^x$ u točki 0.

$$y' = (x)' \cdot e^{x} + x \cdot (e^{x})'$$
$$y' = 1 \cdot e^{x} + x$$

$$(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)$$
 $(x^n)' = nx^{n-1}$

$$(x^n)'=nx^{n-1}$$

 $(e^x)'=e^x$

Zadatak 4

Odredite derivaciju funkcije $y = xe^x$ u točki 0.

$$y' = (x)' \cdot e^{x} + x \cdot (e^{x})'$$
$$y' = 1 \cdot e^{x} + x \cdot e^{x}$$

$$(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)$$
 $(x^n)' = nx^{n-1}$

$$(x^n)' = nx^{n-1}$$

 $(e^x)'=e^x$

Zadatak 4

Odredite derivaciju funkcije $y = xe^x$ u točki 0.

$$y' = (x)' \cdot e^{x} + x \cdot (e^{x})'$$
$$y' = 1 \cdot e^{x} + x \cdot e^{x}$$
$$y' = (1+x)e^{x}$$

$$(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)$$
 $(x^n)' = nx^{n-1}$

$$(x^n)' = nx^{n-1}$$

 $(e^x)'=e^x$

Zadatak 4

Odredite derivaciju funkcije $y = xe^x$ u točki 0.

$$y' = (x)' \cdot e^{x} + x \cdot (e^{x})'$$
 $y' = 1 \cdot e^{x} + x \cdot e^{x}$
 $y' = (1+x)e^{x}$
 $y'(0) = (1+0) \cdot e^{0}$

$$(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)$$
 $(x^n)' = nx^{n-1}$

 $(e^{x})'=e^{x}$

Zadatak 4

Odredite derivaciju funkcije $y = xe^x$ u točki 0.

$$y' = (x)' \cdot e^{x} + x \cdot (e^{x})'$$

$$y' = 1 \cdot e^{x} + x \cdot e^{x}$$

$$y' = (1+x)e^{x}$$

$$y'(0) = (1+0) \cdot e^{0}$$

$$y'(0) = 1 \cdot 1$$

$$(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)$$
 $(x^n)' = nx^{n-1}$

$$(x^n)'=nx^{n-1}$$

 $(e^{x})'=e^{x}$

Zadatak 4

Odredite derivaciju funkcije $y = xe^x$ u točki 0.

$$y' = (x)' \cdot e^{x} + x \cdot (e^{x})'$$

$$y' = 1 \cdot e^{x} + x \cdot e^{x}$$

$$y' = (1+x)e^{x}$$

$$y'(0) = (1+0) \cdot e^{0}$$

$$y'(0) = 1 \cdot 1$$

$$y'(0) = 1$$

peti zadatak

Odredite derivaciju funkcije
$$y = \frac{x^3 - 5}{x^3 + 5}$$
.

Odredite derivaciju funkcije
$$y = \frac{x^3 - 5}{x^3 + 5}$$
.

$$y' = ----$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

Odredite derivaciju funkcije
$$y = \frac{x^3 - 5}{x^3 + 5}$$
.

$$y' = \frac{1}{(x^3 + 5)^2}$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

Odredite derivaciju funkcije $y = \frac{x^3 - 5}{x^3 + 5}$.

$$y' = \frac{(x^3 - 5)'}{(x^3 + 5)^2}$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

Odredite derivaciju funkcije $y = \frac{x^3 - 5}{x^3 + 5}$.

$$y' = \frac{(x^3 - 5)' \cdot (x^3 + 5)^2}$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

Odredite derivaciju funkcije $y = \frac{x^3 - 5}{x^3 + 5}$.

$$y' = \frac{(x^3 - 5)' \cdot (x^3 + 5)}{(x^3 + 5)^2}$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

Odredite derivaciju funkcije
$$y = \frac{x^3 - 5}{x^3 + 5}$$
.

$$y' = \frac{(x^3 - 5)' \cdot (x^3 + 5) - (x^3 + 5)^2}{(x^3 + 5)^2}$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

Odredite derivaciju funkcije $y = \frac{x^3 - 5}{x^3 + 5}$.

$$y' = \frac{(x^3 - 5)' \cdot (x^3 + 5) - (x^3 - 5)}{(x^3 + 5)^2}$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

Odredite derivaciju funkcije $y = \frac{x^3 - 5}{x^3 + 5}$.

$$y' = \frac{(x^3 - 5)' \cdot (x^3 + 5) - (x^3 - 5) \cdot (x^3 + 5)^2}{(x^3 + 5)^2}$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

Odredite derivaciju funkcije $y = \frac{x^3 - 5}{x^3 + 5}$.

$$y' = \frac{(x^3 - 5)' \cdot (x^3 + 5) - (x^3 - 5) \cdot (x^3 + 5)'}{(x^3 + 5)^2}$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

Odredite derivaciju funkcije
$$y = \frac{x^3 - 5}{x^3 + 5}$$
.

$$y' = \frac{(x^3 - 5)' \cdot (x^3 + 5) - (x^3 - 5) \cdot (x^3 + 5)'}{(x^3 + 5)^2} =$$
- ______

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

(u-v)'(x)=u'(x)-v'(x)

Zadatak 5

Odredite derivaciju funkcije
$$y = \frac{x^3 - 5}{x^3 + 5}$$
.

$$y' = \frac{(x^3 - 5)' \cdot (x^3 + 5) - (x^3 - 5) \cdot (x^3 + 5)'}{(x^3 + 5)^2} = \frac{(x^3 - 5)' \cdot (x^3 + 5)'}{(x^3 + 5)^2}$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

Odredite derivaciju funkcije $y = \frac{x^3 - 5}{x^3 + 5}$.

Rješenje

$$y' = \frac{(x^3 - 5)' \cdot (x^3 + 5) - (x^3 - 5) \cdot (x^3 + 5)'}{(x^3 + 5)^2} =$$

$$= \frac{3x^2}{(x^3 + 5)^2}$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

 $(x^n)' = nx^{n-1}$

Odredite derivaciju funkcije $y = \frac{x^3 - 5}{x^3 \perp 5}$.

$$y' = \frac{(x^3 - 5)' \cdot (x^3 + 5) - (x^3 - 5) \cdot (x^3 + 5)'}{(x^3 + 5)^2} =$$
$$= \frac{3x^2 \cdot (x^3 + 5)}{(x^3 + 5)^2}$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

$$(x^n)' = nx^{n-1}$$

Odredite derivaciju funkcije $y = \frac{x^3 - 5}{\sqrt{3 + \kappa}}$.

$$y' = \frac{(x^3 - 5)' \cdot (x^3 + 5) - (x^3 - 5) \cdot (x^3 + 5)'}{(x^3 + 5)^2} =$$
$$= \frac{3x^2 \cdot (x^3 + 5) - (x^3 + 5)^2}{(x^3 + 5)^2}$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

$$(x^n)' = nx^{n-1}$$

Odredite derivaciju funkcije $y = \frac{x^3 - 5}{\sqrt{3 + \kappa}}$.

$$y' = \frac{(x^3 - 5)' \cdot (x^3 + 5) - (x^3 - 5) \cdot (x^3 + 5)'}{(x^3 + 5)^2} =$$
$$= \frac{3x^2 \cdot (x^3 + 5) - (x^3 - 5)}{(x^3 + 5)^2}$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

$$(x^n)' = nx^{n-1}$$

Odredite derivaciju funkcije
$$y = \frac{x^3 - 5}{x^3 + 5}$$
.
$$(u+v)'(x) = u'(x) + v'(x)$$

$$y' = \frac{(x^3 - 5)' \cdot (x^3 + 5) - (x^3 - 5) \cdot (x^3 + 5)'}{(x^3 + 5)^2} =$$
$$3x^2 \cdot (x^3 + 5) - (x^3 - 5) \cdot$$

$$=\frac{3x^2\cdot(x^3+5)-(x^3-5)\cdot}{(x^3+5)^2}$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

$$(x^n)' = nx^{n-1}$$

$$\frac{(x^n)' = nx^{n-1}}{(c)' = 0}$$

Odredite derivaciju funkcije
$$y = \frac{x^3 - 5}{x^3 + 5}$$
.
$$(u+v)'(x) = u'(x) + v'(x)$$

Rješenje

$$y' = \frac{(x^3 - 5)' \cdot (x^3 + 5) - (x^3 - 5) \cdot (x^3 + 5)'}{(x^3 + 5)^2} =$$
$$= \frac{3x^2 \cdot (x^3 + 5) - (x^3 - 5) \cdot 3x^2}{(x^3 + 5)^2}$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

$$(x^n)' = nx^{n-1}$$

Odredite derivaciju funkcije $y = \frac{x^3 - 5}{x^3 + 5}$. $\frac{(u+v)'(x) = u'(x) + v'(x)}{(u+v)'(x)}$

Rješenje

 $y' = \frac{(x^3 - 5)' \cdot (x^3 + 5) - (x^3 - 5) \cdot (x^3 + 5)'}{(x^3 + 5)^2} =$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

$$=\frac{3x^2\cdot(x^3+5)-(x^3-5)\cdot 3x^2}{(x^3+5)^2}=$$

$$(x^n)' = nx^{n-1}$$

$$nx^{n-1}$$

$$n \times n - 1$$

$$(c)' = 0$$

$$5/20$$

Odredite derivaciju funkcije $y = \frac{x^3 - 5}{x^3 + 5}$. $\frac{(u+v)'(x) = u'(x) + v'(x)}{(u+v)'(x)}$

$$y' = \frac{(x^3 - 5)' \cdot (x^3 + 5) - (x^3 - 5) \cdot (x^3 + 5)'}{(x^3 + 5)^2} =$$
$$= \frac{3x^2 \cdot (x^3 + 5) - (x^3 - 5) \cdot 3x^2}{(x^3 + 5)^2} =$$

$$-(x^3+5)^2$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

$$(x^n)' = nx^{n-1}$$

$$(c)'=0$$

Odredite derivaciju funkcije
$$y = \frac{x^3 - 5}{x^3 + 5}$$
. $(u+v)'(x) = u'(x) + v'(x)$ Rješenje

$$=\frac{3x^5}{(x^3+5)^2}$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

$$y' = \frac{(x^3 - 5)' \cdot (x^3 + 5) - (x^3 - 5) \cdot (x^3 + 5)'}{(x^3 + 5)^2} =$$

$$=\frac{3x^2\cdot(x^3+5)-(x^3-5)\cdot3x^2}{(x^3+5)^2}=$$

$$(x^n)' = nx^{n-1}$$

Odredite derivaciju funkcije
$$y = \frac{x^3 - 5}{x^3 + 5}$$
. $(u+v)'(x) = u'(x) + v'(x)$ Rješenje

$$y' = \frac{(x^3 - 5)' \cdot (x^3 + 5) - (x^3 - 5) \cdot (x^3 + 5)'}{(x^3 + 5)^2} =$$

$$= \frac{3x^2 \cdot (x^3 + 5) - (x^3 - 5) \cdot 3x^2}{(x^3 + 5)^2} =$$

$$= \frac{3x^5 + 15x^2}{(x^3 + 5)^2}$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

$$(x) \cdot v'(x)$$

$$(x^n)' = nx^{n-1}$$

(c)' = 0

(u-v)'(x) = u'(x) - v'(x)

5/20

Odredite derivaciju funkcije
$$y = \frac{x^3 - 5}{x^3 + 5}$$
.
$$(u+v)'(x) = u'(x) + v'(x)$$

(u-v)'(x) = u'(x) - v'(x)

Rješenje

$$y' = \frac{(x^3 - 5)' \cdot (x^3 + 5) - (x^3 - 5) \cdot (x^3 + 5)'}{(x^3 + 5)^2} =$$

$$= \frac{3x^2 \cdot (x^3 + 5) - (x^3 - 5) \cdot 3x^2}{(x^3 + 5)^2} =$$

$$= \frac{3x^5 + 15x^2 - 3x^5}{(x^3 + 5)^2}$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

$$(x^n)' = nx^{n-1}$$

(c)' = 05/20

Odredite derivaciju funkcije $y = \frac{x^3 - 5}{x^3 + 5}$. (u+v)'(x) = u'(x) + v'(x)

Rješenje

$$y' = \frac{(x^3 - 5)' \cdot (x^3 + 5) - (x^3 - 5) \cdot (x^3 + 5)'}{(x^3 + 5)^2} =$$

$$= \frac{3x^2 \cdot (x^3 + 5) - (x^3 - 5) \cdot 3x^2}{(x^3 + 5)^2} =$$

$$= \frac{3x^5 + 15x^2 - 3x^5 + 15x^2}{(x^3 + 5)^2}$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

$$(x^n)' = nx^{n-1}$$

(u-v)'(x) = u'(x) - v'(x)

(c)' = 05/20

Odredite derivaciju funkcije $y = \frac{x^3 - 5}{x^3 + 5}$. (u+v)'(x) = u'(x) + v'(x)

(u-v)'(x) = u'(x) - v'(x)

Rješenje

$$=\frac{3x^2\cdot(x^3+5)-(x^3-5)\cdot 3x^2}{(x^3+5)^2}=$$

$$=\frac{3x^5+15x^2-3x^5+15x^2}{(x^3+5)^2}=\frac{30x^2}{(x^3+5)^2}$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

 $y' = \frac{(x^3 - 5)' \cdot (x^3 + 5) - (x^3 - 5) \cdot (x^3 + 5)'}{(x^3 + 5)^2} =$

$$(x^n)' = nx^{n-1}$$

$$(c)' = 0$$

5/20

šesti zadatak

Odredite derivaciju funkcije $y = \sqrt[3]{x} \log_2 x$.

Odredite derivaciju funkcije $y = \sqrt[3]{x} \log_2 x$.

$\sqrt[n]{x^m} = x^{\frac{m}{n}}$

$$y' = \left(\sqrt[3]{x} \log_2 x\right)'$$

Odredite derivaciju funkcije $y = \sqrt[3]{x} \log_2 x$.

$\sqrt[n]{x^m} = x^{\frac{m}{n}}$

$$y' = \left(\sqrt[3]{x} \log_2 x\right)' = \left(x^{\frac{1}{3}} \log_2 x\right)'$$

$$(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)$$

Odredite derivaciju funkcije $y = \sqrt[3]{x} \log_2 x$.

$\sqrt[n]{x^m} = x^{\frac{m}{n}}$

$$y' = \left(\sqrt[3]{x} \log_2 x\right)' = \left(x^{\frac{1}{3}} \log_2 x\right)' =$$
$$= \left(x^{\frac{1}{3}}\right)'$$

$$(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)$$

Odredite derivaciju funkcije $y = \sqrt[3]{x} \log_2 x$.



$$y' = \left(\sqrt[3]{x} \log_2 x\right)' = \left(x^{\frac{1}{3}} \log_2 x\right)' =$$
$$= \left(x^{\frac{1}{3}}\right)'.$$

$$(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)$$

Odredite derivaciju funkcije $y = \sqrt[3]{x} \log_2 x$.

$\sqrt[n]{x^m} = x^{\frac{m}{n}}$

$$y' = \left(\sqrt[3]{x} \log_2 x\right)' = \left(x^{\frac{1}{3}} \log_2 x\right)' =$$
$$= \left(x^{\frac{1}{3}}\right)' \cdot \log_2 x$$

$$(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)$$

Odredite derivaciju funkcije $y = \sqrt[3]{x} \log_2 x$.

$\sqrt[n]{x^m} = x^{\frac{m}{n}}$

$$y' = \left(\sqrt[3]{x} \log_2 x\right)' = \left(x^{\frac{1}{3}} \log_2 x\right)' =$$
$$= \left(x^{\frac{1}{3}}\right)' \cdot \log_2 x +$$

$$(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)$$

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$$= \left(x^{\frac{1}{3}}\right)' \cdot \log_2 x + x^{\frac{1}{3}} \cdot$$

$$(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)$$

Odredite derivaciju funkcije $y = \sqrt[3]{x} \log_2 x$.



$$y' = \left(\sqrt[3]{x} \log_2 x\right)' = \left(x^{\frac{1}{3}} \log_2 x\right)' =$$
$$= \left(x^{\frac{1}{3}}\right)' \cdot \log_2 x + x^{\frac{1}{3}} \cdot (\log_2 x)'$$

$$(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)$$

Odredite derivaciju funkcije $y = \sqrt[3]{x} \log_2 x$.

$\sqrt[n]{x^m} = x^{\frac{m}{n}}$

$$y' = (\sqrt[3]{x} \log_2 x)' = (x^{\frac{1}{3}} \log_2 x)' =$$

$$= (x^{\frac{1}{3}})' \cdot \log_2 x + x^{\frac{1}{3}} \cdot (\log_2 x)' =$$

$$= \frac{1}{3} x^{-\frac{2}{3}}$$

$$(x^n)' = nx^{n-1}$$

Odredite derivaciju funkcije $y = \sqrt[3]{x} \log_2 x$.

$\sqrt[n]{x^m} = x^{\frac{m}{n}}$

$$y' = (\sqrt[3]{x} \log_2 x)' = (x^{\frac{1}{3}} \log_2 x)' =$$

$$= (x^{\frac{1}{3}})' \cdot \log_2 x + x^{\frac{1}{3}} \cdot (\log_2 x)' =$$

$$= \frac{1}{3} x^{-\frac{2}{3}} \log_2 x$$

$$(x^n)' = nx^{n-1}$$

Odredite derivaciju funkcije $y = \sqrt[3]{x} \log_2 x$.



$$y' = (\sqrt[3]{x} \log_2 x)' = (x^{\frac{1}{3}} \log_2 x)' =$$

$$= (x^{\frac{1}{3}})' \cdot \log_2 x + x^{\frac{1}{3}} \cdot (\log_2 x)' =$$

$$= \frac{1}{3} x^{-\frac{2}{3}} \log_2 x +$$

$$(x^n)' = nx^{n-1}$$

Odredite derivaciju funkcije $y = \sqrt[3]{x} \log_2 x$.

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$$y' = (\sqrt[3]{x} \log_2 x)' = (x^{\frac{1}{3}} \log_2 x)' =$$

$$= (x^{\frac{1}{3}})' \cdot \log_2 x + x^{\frac{1}{3}} \cdot (\log_2 x)' =$$

$$= \frac{1}{3} x^{-\frac{2}{3}} \log_2 x + x^{\frac{1}{3}}$$

$$(x^n)' = nx^{n-1}$$

$$(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)$$

Odredite derivaciju funkcije $y = \sqrt[3]{x} \log_2 x$.



$$y' = (\sqrt[3]{x} \log_2 x)' = (x^{\frac{1}{3}} \log_2 x)' =$$

$$= (x^{\frac{1}{3}})' \cdot \log_2 x + x^{\frac{1}{3}} \cdot (\log_2 x)' =$$

$$= \frac{1}{3} x^{-\frac{2}{3}} \log_2 x + x^{\frac{1}{3}} \cdot$$

$$(x^n)' = nx^{n-1}$$

$$(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)$$

Odredite derivaciju funkcije $y = \sqrt[3]{x} \log_2 x$.

$\sqrt[n]{x^m} = x^{\frac{m}{n}}$

$$y' = (\sqrt[3]{x} \log_2 x)' = (x^{\frac{1}{3}} \log_2 x)' =$$

$$= (x^{\frac{1}{3}})' \cdot \log_2 x + x^{\frac{1}{3}} \cdot (\log_2 x)' =$$

$$= \frac{1}{3} x^{-\frac{2}{3}} \log_2 x + x^{\frac{1}{3}} \cdot \frac{1}{x \ln 2}$$

$$(x^n)' = nx^{n-1}$$

$$(\log_a x)' = \frac{1}{x \ln a}$$

$$(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)$$

Odredite derivaciju funkcije $y = \sqrt[3]{x} \log_2 x$.

$\sqrt[n]{x^m} = x^{\frac{m}{n}}$

$$y' = \left(\sqrt[3]{x} \log_2 x\right)' = \left(x^{\frac{1}{3}} \log_2 x\right)' =$$

$$= \left(x^{\frac{1}{3}}\right)' \cdot \log_2 x + x^{\frac{1}{3}} \cdot (\log_2 x)' =$$

$$= \frac{1}{3} x^{-\frac{2}{3}} \log_2 x + x^{\frac{1}{3}} \cdot \frac{1}{x \ln 2} =$$

$$= \frac{1}{3} x^{-\frac{2}{3}} \log_2 x +$$

$$(\log_a x)' = \frac{1}{x \ln a}$$

$$(x^n)' = nx^{n-1}$$

$$(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)$$

Odredite derivaciju funkcije $y = \sqrt[3]{x} \log_2 x$.

$\frac{\sqrt[n]{x^m} = x^{\frac{m}{n}}}{x^n}$

$$y' = \left(\sqrt[3]{x} \log_2 x\right)' = \left(x^{\frac{1}{3}} \log_2 x\right)' =$$

$$= \left(x^{\frac{1}{3}}\right)' \cdot \log_2 x + x^{\frac{1}{3}} \cdot (\log_2 x)' =$$

$$= \frac{1}{3} x^{-\frac{2}{3}} \log_2 x + x^{\frac{1}{3}} \cdot \frac{1}{x \ln 2} =$$

$$= \frac{1}{3} x^{-\frac{2}{3}} \log_2 x + \frac{x^{-\frac{2}{3}}}{\ln 2}$$

$$(x^n)' = nx^{n-1}$$

$$(\log_a x)' = \frac{1}{x \ln a}$$

$$(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)$$

Odredite derivaciju funkcije $y = \sqrt[3]{x} \log_2 x$.

 $\frac{\sqrt[n]{x^m} = x^{\frac{m}{n}}}{x^n}$

Rješenje

$$y' = \left(\sqrt[3]{x} \log_2 x\right)' = \left(x^{\frac{1}{3}} \log_2 x\right)' =$$

$$= \left(x^{\frac{1}{3}}\right)' \cdot \log_2 x + x^{\frac{1}{3}} \cdot (\log_2 x)' =$$

$$= \frac{1}{3} x^{-\frac{2}{3}} \log_2 x + x^{\frac{1}{3}} \cdot \frac{1}{x \ln 2} =$$

$$=\frac{1}{3}x^{-\frac{2}{3}}\log_2 x + \frac{x^{-\frac{2}{3}}}{\ln 2} =$$

$$-\frac{3}{3}x^{-3}\log_2 x + \frac{1}{\ln 2} - \frac{1}{3}$$

$$= \left(\frac{1}{3}x^{-\frac{2}{3}} \right)$$

 $(x^n)'=nx^{n-1}$

 $(\log_a x)' = \frac{1}{x \ln a}$

$$(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)$$

Odredite derivaciju funkcije $y = \sqrt[3]{x} \log_2 x$.

$\sqrt[n]{x^m} = x^{\frac{m}{n}}$ $\frac{x^m}{x^n} = x^{m-n}$

$$y' = \left(\sqrt[3]{x} \log_2 x\right)' = \left(x^{\frac{1}{3}} \log_2 x\right)' =$$

$$= \left(x^{\frac{1}{3}}\right)' \cdot \log_2 x + x^{\frac{1}{3}} \cdot (\log_2 x)' =$$

$$= \frac{1}{3}x^{-\frac{2}{3}} \log_2 x + x^{\frac{1}{3}} \cdot \frac{1}{x \ln 2} =$$

$$= \frac{1}{3}x^{-\frac{2}{3}}\log_2 x + \frac{x^{-\frac{2}{3}}}{\ln 2} =$$

$$3^{1} + \log_2 x + \ln 2$$

$$= \left(\frac{1}{3}\log_2 x\right) x^{-\frac{2}{3}}$$

$$(x^n)' = nx^{n-1}$$

$$(\log_a x)' = \frac{1}{x \ln a}$$

$$(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)$$

Odredite derivaciju funkcije $y = \sqrt[3]{x} \log_2 x$.

 $\frac{\sqrt[n]{x^m} = x^{\frac{m}{n}}}{x^n}$

Rješenje

$$y' = \left(\sqrt[3]{x} \log_2 x\right)' = \left(x^{\frac{1}{3}} \log_2 x\right)' =$$

 $=\left(x^{\frac{1}{3}}\right)' \cdot \log_2 x + x^{\frac{1}{3}} \cdot \left(\log_2 x\right)' =$

$$= \frac{1}{3}x^{-\frac{2}{3}}\log_2 x + x^{\frac{1}{3}} \cdot \frac{1}{x \ln 2} =$$

$$= \frac{1}{3}x^{-\frac{2}{3}}\log_2 x + \frac{x^{-\frac{2}{3}}}{\ln 2} =$$

$$3^{x} - \log_2 x + \ln 2$$

$$= \left(\frac{1}{3}\log_2 x + \right) x^{-\frac{2}{3}}$$

$$(x^n)' = nx^{n-1}$$

$$(\log_a x)' = \frac{1}{x \ln a}$$

$$(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)$$

Odredite derivaciju funkcije $y = \sqrt[3]{x} \log_2 x$.

 $\frac{\sqrt[n]{x^m} = x^{\frac{m}{n}}}{x^n}$

Rješenje

$$y' = \left(\sqrt[3]{x} \log_2 x\right)' = \left(x^{\frac{1}{3}} \log_2 x\right)' =$$

$$= \left(x^{\frac{1}{3}}\right)' \cdot \log_2 x + x^{\frac{1}{3}} \cdot (\log_2 x)' =$$

$$= \frac{1}{3} x^{-\frac{2}{3}} \log_2 x + x^{\frac{1}{3}} \cdot \frac{1}{x \ln 2} =$$

$$= \frac{1}{3}x^{-\frac{2}{3}}\log_2 x + \frac{x^{-\frac{2}{3}}}{\ln 2} =$$

$$3^{x} + \log_2 x + \ln 2$$

$$= \left(\frac{1}{3}\log_2 x + \frac{1}{\ln 2}\right)x^{-\frac{2}{3}}$$

$$(x) \perp u(x) \cdot v'(x)$$

$$(x^n)'=nx^{n-1}$$

$$(\log_a x)' = \frac{1}{x \ln a}$$

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sedmi zadatak

Odredite derivaciju funkcije $y = \frac{\ln x + 1}{\ln x - 1}$.

Odredite derivaciju funkcije $y = \frac{\ln x + 1}{\ln x - 1}$.

$$y' =$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

Odredite derivaciju funkcije $y = \frac{\ln x + 1}{\ln x - 1}$.

$$y' = \frac{}{\left(\ln x - 1\right)^2}$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

Odredite derivaciju funkcije $y = \frac{\ln x + 1}{\ln x - 1}$.

$$y' = \frac{(\ln x + 1)'}{(\ln x - 1)^2}$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

Odredite derivaciju funkcije $y = \frac{\ln x + 1}{\ln x - 1}$.

$$y' = \frac{(\ln x + 1)' \cdot }{(\ln x - 1)^2}$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

Odredite derivaciju funkcije $y = \frac{\ln x + 1}{\ln x - 1}$.

$$y' = \frac{(\ln x + 1)' \cdot (\ln x - 1)}{(\ln x - 1)^2}$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

Odredite derivaciju funkcije $y = \frac{\ln x + 1}{\ln x - 1}$.

$$y' = \frac{(\ln x + 1)' \cdot (\ln x - 1) -}{(\ln x - 1)^2}$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

Odredite derivaciju funkcije $y = \frac{\ln x + 1}{\ln x - 1}$.

$$y' = \frac{(\ln x + 1)' \cdot (\ln x - 1) - (\ln x + 1)}{(\ln x - 1)^2}$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

Odredite derivaciju funkcije $y = \frac{\ln x + 1}{\ln x - 1}$.

$$y' = \frac{(\ln x + 1)' \cdot (\ln x - 1) - (\ln x + 1) \cdot}{(\ln x - 1)^2}$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

Odredite derivaciju funkcije $y = \frac{\ln x + 1}{\ln x - 1}$.

$$y' = \frac{(\ln x + 1)' \cdot (\ln x - 1) - (\ln x + 1) \cdot (\ln x - 1)'}{(\ln x - 1)^2}$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

Odredite derivaciju funkcije $y = \frac{\ln x + 1}{\ln x - 1}$.

$$y' = \frac{(\ln x + 1)' \cdot (\ln x - 1) - (\ln x + 1) \cdot (\ln x - 1)'}{(\ln x - 1)^2} =$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

(u+v)'(x) = u'(x) + v'(x)

Odredite derivaciju funkcije $y = \frac{\ln x + 1}{\ln x - 1}$.

$$y' = \frac{(\ln x + 1)' \cdot (\ln x - 1) - (\ln x + 1) \cdot (\ln x - 1)'}{(\ln x - 1)^2} =$$

$$= \frac{1}{\left(\ln x - 1\right)^2}$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

Odredite derivaciju funkcije $y = \frac{\ln x + 1}{\ln x - 1}$.

Rješenje
,
$$(\ln x + 1)' \cdot (\ln x - 1) - 0$$

$$y' = \frac{(\ln x + 1)' \cdot (\ln x - 1) - (\ln x + 1) \cdot (\ln x - 1)'}{(\ln x - 1)^2} =$$

(u+v)'(x) = u'(x) + v'(x)

$$\frac{1}{x}$$

$$=\frac{\frac{1}{x}}{(\ln x - 1)^2}$$

$$(c) = 0$$

$$(\ln x)' = \frac{1}{x}$$

$$=\frac{\frac{1}{x}}{(\ln x - 1)^2}$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

(u+v)'(x) = u'(x) + v'(x)

Odredite derivaciju funkcije $y = \frac{\ln x + 1}{\ln x - 1}$.

Rješenje
$$(\ln x + 1)' \cdot (\ln x - 1) -$$

$$y' = \frac{(\ln x + 1)' \cdot (\ln x - 1) - (\ln x + 1) \cdot (\ln x - 1)'}{(\ln x - 1)^2} =$$

$$(\ln x - 1)^2$$

$$=\frac{\frac{1}{x}}{x}$$
.

$$(c)' = \frac{(c)' = \frac{1}{2}}{(c)' + \frac{1}{2}}$$

$$=\frac{1}{X}$$

$$=\frac{x}{\left(\ln x-1\right)^{2}}$$

$$\left(\ln x\right)'=\frac{1}{x}$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

(u+v)'(x) = u'(x) + v'(x)

Odredite derivaciju funkcije $y = \frac{\ln x + 1}{\ln x - 1}$.

Rješenje
$$(\ln x + 1)' \cdot (\ln x - 1) -$$

$$y' = \frac{(\ln x + 1)' \cdot (\ln x - 1) - (\ln x + 1) \cdot (\ln x - 1)'}{(\ln x - 1)^2} =$$

$$\frac{1}{x} \cdot (\ln x - 1)$$

$$(c)' =$$

$$=\frac{\frac{1}{x}\cdot (\ln x-1)}{\left(\ln x-1\right)^2}$$

$$(c) = 0$$

$$(\ln x)' = \frac{1}{x}$$

$$=\frac{x^{-(11)}x^{-1}}{(11)}$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

(u+v)'(x) = u'(x) + v'(x)

Odredite derivaciju funkcije $y = \frac{\ln x + 1}{\ln x - 1}$.

Rješenje,
$$(\ln x + 1)' \cdot (\ln x - 1) - \dots$$

$$y' = \frac{(\ln x + 1)' \cdot (\ln x - 1) - (\ln x + 1) \cdot (\ln x - 1)'}{(\ln x - 1)^2} =$$

$$\frac{1}{2} \cdot (\ln x - 1) -$$

$$(x-1)^2$$

$$=\frac{\frac{1}{x}\cdot (\ln x - 1) - }{(\ln x - 1)}$$

$$(c)' = 0$$

$$=\frac{\frac{1}{x}\cdot \left(\ln x-1\right)-}{\left(\ln x-1\right)^2}$$

$$(\ln x)' = \frac{1}{x}$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

(u+v)'(x) = u'(x) + v'(x)

Odredite derivaciju funkcije $y = \frac{\ln x + 1}{\ln x - 1}$.

Rješenje
,
$$(\ln x + 1)' \cdot (\ln x - 1) -$$

$$-\left(\ln x+1
ight)\cdot\left(\ln x-1
ight)'$$

$$v' = \frac{(\ln x + 1)' \cdot (\ln x - 1) - (\ln x - 1)}{(\ln x + 1)' \cdot (\ln x - 1)}$$

$$y' = rac{(\ln x + 1)' \, \cdot \, (\ln x - 1) \, - \, (\ln x + 1) \, \cdot \, (\ln x - 1)'}{(\ln x - 1)^2} =$$

$$\frac{1}{x}\cdot (\ln x - 1) - (\ln x + 1)$$

$$(c)'=0$$

$$=\frac{\frac{1}{x}\cdot \left(\ln x-1\right)-\left(\ln x+1\right)}{\left(\ln x-1\right)^2}$$

$$(c) = 0$$

$$=\frac{x}{\left(\ln x-1\right)^2}$$

$$(\ln x)' = \frac{1}{x}$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

(u+v)'(x) = u'(x) + v'(x)

Odredite derivaciju funkcije $y = \frac{\ln x + 1}{\ln x - 1}$.

Rješenje ,
$$(\ln x + 1)' \cdot (\ln x - 1) - 0$$

$$v' = \frac{(\ln x + 1)' \cdot (\ln x - 1) - (\ln x - 1)}{(\ln x + 1)' \cdot (\ln x - 1)}$$

$$- (\ln x + 1) \cdot (\ln x - 1)'$$

$$y' = rac{\left(\ln x + 1
ight)' \,\cdot\, \left(\ln x - 1
ight) \,-\, \left(\ln x + 1
ight) \,\cdot\, \left(\ln x - 1
ight)'}{\left(\ln x - 1
ight)^2} =$$

$$=\frac{\frac{1}{x}\cdot \left(\ln x-1\right)-\left(\ln x+1\right)\cdot}{\left(\ln x-1\right)^2}$$

$$(c)' = 0$$

$$(\ln x)' = \frac{1}{x}$$

$$(\ln x - 1)$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

(u+v)'(x) = u'(x) + v'(x)

Odredite derivaciju funkcije $y = \frac{\ln x + 1}{\ln x - 1}$.

Rješenje ,
$$(\ln x + 1)' \cdot (\ln x - 1) - 0$$

$$y' = \frac{(\ln x + 1)' \cdot (\ln x - 1) - (\ln x + 1) \cdot (\ln x - 1)'}{(\ln x - 1)^2} =$$

$$=\frac{\frac{1}{x}\cdot \left(\ln x-1\right)-\left(\ln x+1\right)\cdot \frac{1}{x}}{\left(\ln x-1\right)^2}$$

$$(c)' = 0$$

 $(\ln x)' = \frac{1}{-}$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

(u+v)'(x) = u'(x) + v'(x)

Odredite derivaciju funkcije $y = \frac{\ln x + 1}{\ln x - 1}$.

$$(\ln x + 1)' \cdot (\ln x - 1) = 0$$

Rješenje
$$y' = \frac{(\ln x + 1)' \cdot (\ln x - 1) - (\ln x + 1) \cdot (\ln x - 1)'}{(\ln x - 1)^2} =$$

$$y = \frac{1}{(\ln x - 1)} \quad (\ln x + 1)$$

$$= \frac{\frac{1}{x} \cdot (\ln x - 1) - (\ln x + 1) \cdot \frac{1}{x}}{(\ln x - 1)^2} =$$

$$(c)' = 0$$

$$(\ln x)' = \frac{1}{x}$$

$$(\ln x - 1)$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

$$=\frac{x^{(11)x^{-1}}(11)x^{-1}}{(\ln x-1)^2}$$

Odredite derivaciju funkcije $y = \frac{\ln x + 1}{\ln x - 1}$.

$$y' = \frac{(\ln x + 1)' \cdot (\ln x - 1) - (\ln x - 1)}{(\ln x + 1)' \cdot (\ln x - 1)}$$

 $y' = \frac{(\ln x + 1)' \cdot (\ln x - 1) - (\ln x + 1) \cdot (\ln x - 1)'}{(\ln x - 1)^2} =$

$$y' = \frac{(\ln x + 1)' \cdot (\ln x - 1) - (\ln x - 1)}{(\ln x + 1)' \cdot (\ln x - 1)}$$

$$^{\prime}\cdot\left(\ln x-1
ight) -\left(% -1
ight)$$

$$\frac{-\left(\ln x\right)^{2}}{\left(-1\right)^{2}}$$

$$(-1)^2$$

(u+v)'(x) = u'(x) + v'(x)

 $(\ln x)' = \frac{1}{-}$

 $= \frac{\frac{1}{x} \cdot (\ln x - 1) - (\ln x + 1) \cdot \frac{1}{x}}{(\ln x - 1)^2} =$

 $(\ln x - 1)^2$

Odredite derivaciju funkcije $y = \frac{\ln x + 1}{\ln x - 1}$.

Kjesenje
$$(\ln x + 1)' \cdot (\ln x - 1) - \dots$$

 $=\frac{x^{\dots}}{(\ln x-1)^2}$

 $\frac{1}{-} \ln x$

$$y' = \frac{(\ln x + 1)' \cdot (\ln x - 1) - (\ln x + 1) \cdot (\ln x - 1)'}{(\ln x - 1)^2} =$$

$$v' = \frac{(\ln x + 1)' \cdot (\ln x - 1) - 0}{(\ln x + 1)' \cdot (\ln x - 1)}$$

Rješenje

ješenje
$$(\ln x + 1)' \cdot (\ln x - 1) - ($$

enje
$$(\ln x + 1)' \cdot (\ln x - 1) = 0$$

$$(\ln v \perp 1)^t \cdot (\ln v - 1) = (1$$

 $= \frac{\frac{1}{x} \cdot (\ln x - 1) - (\ln x + 1) \cdot \frac{1}{x}}{(\ln x - 1)^2} =$

$$\ln x - 1$$

$$\underbrace{(u+v)'(x) = u'(x) + v'(x)}_{+1}.$$

 $\left| \left(\frac{u}{v} \right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2} \right|$

 $(\ln x)' = \frac{1}{-}$

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

Odredite derivaciju funkcije $y = \frac{\ln x + 1}{\ln x - 1}$

Rješenje
$$(\ln x + 1)' \cdot (\ln x - 1) = 0$$

$$y' = \frac{(\ln x + 1)' \cdot (\ln x - 1) - (\ln x + 1) \cdot (\ln x - 1)'}{(\ln x - 1)^2} =$$

$$= \frac{\frac{1}{x} \cdot (\ln x - 1) - (\ln x + 1) \cdot \frac{1}{x}}{(\ln x - 1)^2} =$$

$$\frac{1}{x} = \frac{(c)' = 0}{a}$$

(u+v)'(x) = u'(x) + v'(x)

$$(\ln x - 1)^2$$

$$= \frac{\frac{1}{x} \ln x - \frac{1}{x}}{2}$$

$$(\ln x)' = \frac{1}{x}$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

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(u+v)'(x) = u'(x) + v'(x)

Odredite derivaciju funkcije $y = \frac{\ln x + 1}{\ln x - 1}$

Rješenje
$$(\ln x + 1)' \cdot (\ln x - 1) - (\ln x - 1)'$$

$$y' = \frac{(\ln x + 1)' \cdot (\ln x - 1) - (\ln x + 1) \cdot (\ln x - 1)'}{(\ln x - 1)^2} =$$

$$= \frac{\frac{1}{x} \cdot (\ln x - 1) - (\ln x + 1) \cdot \frac{1}{x}}{(\ln x - 1)^2} =$$

$$\frac{1}{\ln x} \cdot \frac{1}{\ln x} \cdot \frac{1}{\ln x} = \frac{1}{\ln x} =$$

$$(c)'=0$$

 $= \frac{\frac{1}{x} \ln x - \frac{1}{x} - \frac{1}{x} \ln x}{(\ln x - 1)^2}$

$$(\ln x)' = \frac{1}{x}$$

 $\left| \left(\frac{u}{v} \right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2} \right|$

 $\frac{(u+v)'(x)=u'(x)+v'(x)}{\frac{1}{1}}.$

Odredite derivaciju funkcije $y = \frac{\ln x + 1}{\ln x - 1}$.

Rješenje

$$y' = \frac{(\ln x + 1)' \cdot (\ln x - 1) - (\ln x + 1) \cdot (\ln x - 1)'}{(\ln x - 1)^2} =$$

$$= \frac{\frac{1}{x} \cdot (\ln x - 1) - (\ln x + 1) \cdot \frac{1}{x}}{(\ln x - 1)^{2}} =$$

$$= \frac{\frac{1}{x} \ln x - \frac{1}{x} - \frac{1}{x} \ln x - \frac{1}{x}}{(\ln x - 1)^{2}}$$

(c)' = 0

 $\frac{1}{2} = \frac{1}{x}$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

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 $\frac{1}{1}.$

Odredite derivaciju funkcije $y = \frac{\ln x + 1}{\ln x - 1}$.

Rješenje

$$y' = \frac{(\ln x + 1)' \cdot (\ln x - 1) - (\ln x + 1) \cdot (\ln x - 1)'}{(\ln x - 1)^2} =$$

$$=rac{rac{1}{x}\cdot \left(\ln x-1
ight) -\left(\ln x+1
ight) \cdot rac{1}{x}}{\left(\ln x-1
ight) ^{2}}=$$

 $= \frac{\frac{1}{x}\ln x - \frac{1}{x} - \frac{1}{x}\ln x - \frac{1}{x}}{(\ln x - 1)^2} = \frac{-\frac{2}{x}}{(\ln x - 1)^2}$

 $\frac{(c)' = 0}{(\ln x)' = \frac{1}{-}}$

 $(\ln x - 1)^2$ $\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$

Odredite derivaciju funkcije $y = \frac{\ln x + 1}{\ln x - 1}$

Rješenje
,
$$(\ln x + 1)' \cdot (\ln x - 1) - \dots$$

$$y' = \frac{(\ln x + 1)' \cdot (\ln x - 1) - (\ln x + 1) \cdot (\ln x - 1)'}{(\ln x - 1)^2} =$$

 $= \frac{\frac{1}{x} \cdot (\ln x - 1) - (\ln x + 1) \cdot \frac{1}{x}}{(\ln x - 1)^2} =$



$$=\frac{\frac{1}{x}\ln x - \frac{1}{x} - \frac{1}{x}\ln x - \frac{1}{x}}{(\ln x - 1)^2} = \frac{-\frac{2}{x}}{(\ln x - 1)^2} =$$

(u+v)'(x)=u'(x)+v'(x)

 $\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$

(c)' = 0

 $(\ln x)' = \frac{1}{-}$

osmi zadatak

Odredite derivaciju funkcije $y = 10^x \log x + \ln 10$.

Odredite derivaciju funkcije $y = 10^x \log x + \ln 10$.

$$y' = \left(10^x \log x + \ln 10\right)'$$

$$(u+v)'(x)=u'(x)+v'(x)$$

Odredite derivaciju funkcije $y = 10^x \log x + \ln 10$.

$$y' = (10^x \log x + \ln 10)' = (10^x \log x)' + (\ln 10)'$$

$$(u+v)'(x)=u'(x)+v'(x)$$

Odredite derivaciju funkcije $y = 10^x \log x + \ln 10$.

$$y' = (10^x \log x + \ln 10)' = (10^x \log x)' + (\ln 10)' =$$

= $(10^x)'$

$$(u+v)'(x)=u'(x)+v'(x)$$

$$(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)$$

Odredite derivaciju funkcije $y = 10^x \log x + \ln 10$.

$$y' = (10^x \log x + \ln 10)' = (10^x \log x)' + (\ln 10)' =$$

= $(10^x)'$.

$$(u+v)'(x)=u'(x)+v'(x)$$

$$(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)$$

Odredite derivaciju funkcije $y = 10^x \log x + \ln 10$.

$$y' = (10^x \log x + \ln 10)' = (10^x \log x)' + (\ln 10)' =$$

= $(10^x)' \cdot \log x$

$$(u+v)'(x)=u'(x)+v'(x)$$

$$(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)$$

Odredite derivaciju funkcije $y = 10^x \log x + \ln 10$.

$$y' = (10^x \log x + \ln 10)' = (10^x \log x)' + (\ln 10)' =$$

= $(10^x)' \cdot \log x +$

$$(u+v)'(x)=u'(x)+v'(x)$$

$$(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)$$

Odredite derivaciju funkcije $y = 10^x \log x + \ln 10$.

$$y' = (10^x \log x + \ln 10)' = (10^x \log x)' + (\ln 10)' =$$

= $(10^x)' \cdot \log x + 10^x$

$$(u+v)'(x)=u'(x)+v'(x)$$

$$(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)$$

Odredite derivaciju funkcije $y = 10^x \log x + \ln 10$.

$$y' = (10^x \log x + \ln 10)' = (10^x \log x)' + (\ln 10)' =$$

= $(10^x)' \cdot \log x + 10^x \cdot$

$$(u+v)'(x)=u'(x)+v'(x)$$

$$(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)$$

Odredite derivaciju funkcije $y = 10^x \log x + \ln 10$.

$$y' = (10^x \log x + \ln 10)' = (10^x \log x)' + (\ln 10)' =$$

= $(10^x)' \cdot \log x + 10^x \cdot (\log x)'$

$$(u+v)'(x)=u'(x)+v'(x)$$

$$(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)$$

Odredite derivaciju funkcije $y = 10^x \log x + \ln 10$.

Rješenje

$$y' = (10^{x} \log x + \ln 10)' = (10^{x} \log x)' + (\ln 10)' =$$
$$= (10^{x})' \cdot \log x + 10^{x} \cdot (\log x)' + 0$$

(c)'=0

$$(u+v)'(x)=u'(x)+v'(x)$$

$$(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)$$

Odredite derivaciju funkcije $y = 10^x \log x + \ln 10$.

Rješenje

$$y' = (10^{x} \log x + \ln 10)' = (10^{x} \log x)' + (\ln 10)' =$$

$$= (10^{x})' \cdot \log x + 10^{x} \cdot (\log x)' + 0 =$$

$$= 10^{x} \ln 10$$

$$(c)' = 0$$

 $(a^x)'=a^x \ln a$

$$(u+v)'(x)=u'(x)+v'(x)$$

$$(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)$$

Odredite derivaciju funkcije $y = 10^x \log x + \ln 10$.

Rješenje

$$y' = (10^{x} \log x + \ln 10)' = (10^{x} \log x)' + (\ln 10)' =$$

$$= (10^{x})' \cdot \log x + 10^{x} \cdot (\log x)' + 0 =$$

$$= 10^{x} \ln 10 \cdot \log x$$

$$(c)' = 0$$

 $(a^x)'=a^x \ln a$

$$(u+v)'(x)=u'(x)+v'(x)$$

$$(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)$$

Odredite derivaciju funkcije $y = 10^x \log x + \ln 10$.

Rješenje

$$y' = (10^{x} \log x + \ln 10)' = (10^{x} \log x)' + (\ln 10)' =$$

$$= (10^{x})' \cdot \log x + 10^{x} \cdot (\log x)' + 0 =$$

$$= 10^{x} \ln 10 \cdot \log x +$$

$$(c)' = 0$$

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

$$(u+v)'(x)=u'(x)+v'(x)$$

$$(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)$$

Odredite derivaciju funkcije $y = 10^x \log x + \ln 10$.

Rješenje

$$y' = (10^{x} \log x + \ln 10)' = (10^{x} \log x)' + (\ln 10)' =$$

$$= (10^{x})' \cdot \log x + 10^{x} \cdot (\log x)' + 0 =$$

$$= 10^{x} \ln 10 \cdot \log x + 10^{x}$$

$$(c)' = 0$$

 $(a^x)'=a^x \ln a$

$$(u+v)'(x)=u'(x)+v'(x)$$

$$(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)$$

Odredite derivaciju funkcije $y = 10^x \log x + \ln 10$.

Rješenje

$$y' = (10^{x} \log x + \ln 10)' = (10^{x} \log x)' + (\ln 10)' =$$

$$= (10^{x})' \cdot \log x + 10^{x} \cdot (\log x)' + 0 =$$

$$= 10^{x} \ln 10 \cdot \log x + 10^{x} \cdot$$

$$(c)' = 0$$

 $(a^x)' = a^x \ln a$

$$(\log_a x)' = \frac{1}{x \ln a}$$

$$(u+v)'(x)=u'(x)+v'(x)$$

$$(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)$$

Odredite derivaciju funkcije $y = 10^x \log x + \ln 10$.

Rješenje

$$y' = (10^{x} \log x + \ln 10)' = (10^{x} \log x)' + (\ln 10)' =$$

$$= (10^{x})' \cdot \log x + 10^{x} \cdot (\log x)' + 0 =$$

$$= 10^{x} \ln 10 \cdot \log x + 10^{x} \cdot \frac{1}{x \ln 10}$$

$$(c)' = 0$$

 $(a^x)' = a^x \ln a$

$$(\log_a x)' = \frac{1}{x \ln a}$$

$$(u+v)'(x)=u'(x)+v'(x)$$

$$(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)$$

Odredite derivaciju funkcije $y = 10^x \log x + \ln 10$.

$$y' = (10^{x} \log x + \ln 10)' = (10^{x} \log x)' + (\ln 10)' =$$

$$= (10^{x})' \cdot \log x + 10^{x} \cdot (\log x)' + 0 =$$

$$= 10^{x} \ln 10 \cdot \log x + 10^{x} \cdot \frac{1}{x \ln 10} =$$

$$= \left(\frac{(c)' = 0}{(a^{x})' = a^{x} \ln a} \right)$$

$$(\log_{a} x)' = \frac{1}{x \ln a}$$

$$(u+v)'(x)=u'(x)+v'(x)$$

$$(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)$$

Odredite derivaciju funkcije $y = 10^x \log x + \ln 10$.

$$y' = (10^{x} \log x + \ln 10)' = (10^{x} \log x)' + (\ln 10)' =$$

$$= (10^{x})' \cdot \log x + 10^{x} \cdot (\log x)' + 0 =$$

$$= 10^{x} \ln 10 \cdot \log x + 10^{x} \cdot \frac{1}{x \ln 10} =$$

$$= \left(\ln 10 \log x\right)$$

$$10^{x}$$

$$(\log_{a} x)' = \frac{1}{x \ln a}$$

$$(u+v)'(x)=u'(x)+v'(x)$$

$$(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)$$

Odredite derivaciju funkcije $y = 10^x \log x + \ln 10$.

$$y' = (10^{x} \log x + \ln 10)' = (10^{x} \log x)' + (\ln 10)' =$$

$$= (10^{x})' \cdot \log x + 10^{x} \cdot (\log x)' + 0 =$$

$$= 10^{x} \ln 10 \cdot \log x + 10^{x} \cdot \frac{1}{x \ln 10} =$$

$$= \left(\ln 10 \log x + \right) 10^{x}$$

$$(\log_{a} x)' = \frac{1}{x \ln a}$$

$$(u+v)'(x)=u'(x)+v'(x)$$

$$(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)$$

Odredite derivaciju funkcije $y = 10^x \log x + \ln 10$.

Rješenje

$$y' = (10^{x} \log x + \ln 10)' = (10^{x} \log x)' + (\ln 10)' =$$

$$= (10^{x})' \cdot \log x + 10^{x} \cdot (\log x)' + 0 =$$

$$= 10^{x} \ln 10 \cdot \log x + 10^{x} \cdot \frac{1}{x \ln 10} =$$

$$= \left(\ln 10 \log x + \frac{1}{x \ln 10}\right) 10^{x}$$

$$(c)' = 0$$

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

(u+v)'(x)=u'(x)+v'(x)

$$(uv)'(x) = u'(x) \cdot v(x) + u(x) \cdot v'(x)$$

 $(\log_a x)' = \frac{1}{x \ln a}$

deveti zadatak

Odredite derivaciju funkcije $y = e^{\sqrt{x}}$.

Odredite derivaciju funkcije $y = e^{\sqrt{x}}$.

$$y' =$$

$$(e^{\text{nešto}})' = e^{\text{nešto}} \cdot (\text{nešto})'$$

$$(e^{x})' = e^{x}$$

Odredite derivaciju funkcije $y = e^{\sqrt{x}}$.

$$y' = e^{\sqrt{x}}$$

$$(e^{\text{nešto}})' = e^{\text{nešto}} \cdot (\text{nešto})'$$

$$(e^{x})' = e^{x}$$

Odredite derivaciju funkcije $y = e^{\sqrt{x}}$.

$$y'=e^{\sqrt{x}}$$
 ·

$$(e^{\text{nešto}})' = e^{\text{nešto}} \cdot (\text{nešto})'$$

$$(e^{x})' = e^{x}$$

Odredite derivaciju funkcije $y = e^{\sqrt{x}}$.

$$y' = e^{\sqrt{x}} \cdot (\sqrt{x})'$$

$$(e^{\text{nešto}})' = e^{\text{nešto}} \cdot (\text{nešto})'$$

$$(e^{\text{x}})' = e^{\text{x}}$$

Odredite derivaciju funkcije $y = e^{\sqrt{x}}$.

$$y' = e^{\sqrt{x}} \cdot (\sqrt{x})' = e^{\sqrt{x}}$$

$$\frac{\left(e^{\text{nešto}}\right)' = e^{\text{nešto}} \cdot (\text{nešto})'}{\left(e^{\text{x}}\right)' = e^{\text{x}}}$$

$$\left(\sqrt{x}\right)' = \frac{1}{2\sqrt{x}}$$

Odredite derivaciju funkcije $y = e^{\sqrt{x}}$.

$$y' = e^{\sqrt{x}} \cdot (\sqrt{x})' = e^{\sqrt{x}} \cdot \frac{1}{2\sqrt{x}}$$

$$(e^{\text{nešto}})' = e^{\text{nešto}} \cdot (\text{nešto})'$$

$$(e^{x})' = e^{x}$$

$(\sqrt{x})' = \frac{1}{2\sqrt{x}}$

Zadatak 9

Odredite derivaciju funkcije $y = e^{\sqrt{x}}$.

$$y' = e^{\sqrt{x}} \cdot (\sqrt{x})' = e^{\sqrt{x}} \cdot \frac{1}{2\sqrt{x}}$$

$$y' = \frac{e^{\sqrt{x}}}{2\sqrt{x}}$$

$$\left(e^{\text{nešto}}\right)' = e^{\text{nešto}} \cdot (\text{nešto})'$$

$$(e^x)'=e^x$$

deseti zadatak

Odredite derivaciju funkcije $y = (x^2 + 3x - 5)^{20}$.

Odredite derivaciju funkcije
$$y = (x^2 + 3x - 5)^{20}$$
.

$$y' =$$

$$((\text{nešto})^n)' = n(\text{nešto})^{n-1} \cdot (\text{nešto})'$$
$$(x^n)' = nx^{n-1}$$

Odredite derivaciju funkcije
$$y = (x^2 + 3x - 5)^{20}$$
.

$$y' = 20 \left(x^2 + 3x - 5 \right)^{19}$$

$$((\text{nešto})^n)' = n(\text{nešto})^{n-1} \cdot (\text{nešto})'$$
$$(x^n)' = nx^{n-1}$$

Odredite derivaciju funkcije
$$y = (x^2 + 3x - 5)^{20}$$
.

$$y' = 20 \left(x^2 + 3x - 5 \right)^{19} \cdot$$

$$((\text{nešto})^n)' = n(\text{nešto})^{n-1} \cdot (\text{nešto})'$$
$$(x^n)' = nx^{n-1}$$

Odredite derivaciju funkcije
$$y = (x^2 + 3x - 5)^{20}$$
.

$$y' = 20 (x^2 + 3x - 5)^{19} \cdot (x^2 + 3x - 5)'$$

$$\frac{\left((\text{nešto})^n\right)' = n(\text{nešto})^{n-1} \cdot (\text{nešto})'}{\left(x^n\right)' = nx^{n-1}}$$

Odredite derivaciju funkcije
$$y = (x^2 + 3x - 5)^{20}$$
.

$$y' = 20 (x^2 + 3x - 5)^{19} \cdot (x^2 + 3x - 5)' =$$

= $20 (x^2 + 3x - 5)^{19}$

$$((\text{nešto})^n)' = n(\text{nešto})^{n-1} \cdot (\text{nešto})'$$

$$(x^n)'=nx^{n-1}$$

Odredite derivaciju funkcije
$$y = (x^2 + 3x - 5)^{20}$$
.

$$y' = 20 (x^2 + 3x - 5)^{19} \cdot (x^2 + 3x - 5)' =$$

= $20 (x^2 + 3x - 5)^{19} (2x$

$$((\text{nešto})^n)' = n(\text{nešto})^{n-1} \cdot (\text{nešto})'$$

$$(x^n)'=nx^{n-1}$$

Odredite derivaciju funkcije
$$y = (x^2 + 3x - 5)^{20}$$
.

$$y' = 20 (x^2 + 3x - 5)^{19} \cdot (x^2 + 3x - 5)' =$$

$$= 20 (x^2 + 3x - 5)^{19} (2x + 3)$$

$$((\text{nešto})^n)' = n(\text{nešto})^{n-1} \cdot (\text{nešto})'$$

$$(x^n)' = nx^{n-1}$$

jedanaesti zadatak

Odredite derivaciju funkcije $y = \log_5 (5^x - x^5)$.

Odredite derivaciju funkcije $y = \log_5 (5^x - x^5)$.

$$y' =$$

$$\left(\log_a(\text{nešto})\right)' = \frac{1}{\text{nešto} \cdot \ln a} \cdot (\text{nešto})'$$
 $\left(\log_a x\right)' = \frac{1}{x \ln a}$

$$(\log_a x)' = \frac{1}{x \ln a}$$

Odredite derivaciju funkcije $y = \log_5 (5^x - x^5)$.

$$y'=\frac{1}{\left(5^x-x^5\right)\ln 5}$$

$$\left(\log_a(\text{nešto})\right)' = \frac{1}{\text{nešto} \cdot \ln a} \cdot (\text{nešto})'$$
 $\left(\log_a x\right)' = \frac{1}{x \ln a}$

$$(\log_a x)' = \frac{1}{x \ln a}$$

Odredite derivaciju funkcije $y = \log_5 (5^x - x^5)$.

$$y'=\frac{1}{(5^x-x^5)\ln 5}.$$

$$\left(\log_a(\text{nešto})\right)' = \frac{1}{\text{nešto} \cdot \ln a} \cdot (\text{nešto})'$$
 $\left(\log_a x\right)' = \frac{1}{x \ln a}$

$$(\log_a x)' = \frac{1}{x \ln a}$$

Odredite derivaciju funkcije $y = \log_5 (5^x - x^5)$.

$$y' = \frac{1}{(5^x - x^5) \ln 5} \cdot (5^x - x^5)'$$

$$\left(\log_a(\text{nešto})\right)' = \frac{1}{\text{nešto} \cdot \ln a} \cdot (\text{nešto})'$$
 $\left(\log_a x\right)' = \frac{1}{x \ln a}$

$$(\log_a x)' = \frac{1}{x \ln a}$$

Odredite derivaciju funkcije $y = \log_5 (5^x - x^5)$.

$$y' = \frac{1}{(5^x - x^5) \ln 5} \cdot (5^x - x^5)' = -$$

$$\left(\log_a(\text{nešto})\right)' = \frac{1}{\text{nešto} \cdot \ln a} \cdot (\text{nešto})' \qquad \left(\log_a x\right)' = \frac{1}{x \ln a}$$

$$(\log_a x)' = \frac{1}{x \ln a}$$

$$(a^{x})' = a^{x} \ln a$$
 $(x^{n})' = nx^{n-1}$

$$(x^n)' = nx^{n-1}$$

Odredite derivaciju funkcije $y = \log_5 (5^x - x^5)$.

$$y' = \frac{1}{(5^{x} - x^{5}) \ln 5} \cdot (5^{x} - x^{5})' = \frac{1}{(5^{x} - x^{5}) \ln 5}$$

$$\left(\log_a(\text{nešto})\right)' = \frac{1}{\text{nešto} \cdot \ln a} \cdot (\text{nešto})' \qquad (\log_a x)' = \frac{1}{x \ln a}$$

$$(\log_a x)' = \frac{1}{x \ln a}$$

$$(a^{x})' = a^{x} \ln a$$
 $(x^{n})' = nx^{n-1}$

$$(x^n)' = nx^{n-1}$$

Odredite derivaciju funkcije $y = \log_5 (5^x - x^5)$.

$$y' = \frac{1}{(5^{x} - x^{5}) \ln 5} \cdot (5^{x} - x^{5})' = \frac{5^{x} \ln 5}{(5^{x} - x^{5}) \ln 5}$$

$$\left(\log_a(\text{nešto})\right)' = \frac{1}{\text{nešto} \cdot \ln a} \cdot (\text{nešto})'$$
 $\left(\log_a x\right)' = \frac{1}{x \ln a}$

$$(\log_a x)' = \frac{1}{x \ln a}$$

$$(a^{x})' = a^{x} \ln a$$
 $(x^{n})' = nx^{n-1}$

$$(x^n)' = nx^{n-1}$$

Odredite derivaciju funkcije $y = \log_5 (5^x - x^5)$.

$$y' = \frac{1}{(5^{x} - x^{5}) \ln 5} \cdot (5^{x} - x^{5})' = \frac{5^{x} \ln 5}{(5^{x} - x^{5}) \ln 5}$$

$$\left(\log_a(\text{nešto})\right)' = \frac{1}{\text{nešto} \cdot \ln a} \cdot (\text{nešto})'$$
 $\left(\log_a x\right)' = \frac{1}{x \ln a}$

$$(\log_a x)' = \frac{1}{x \ln a}$$

$$(a^{x})' = a^{x} \ln a$$
 $(x^{n})' = nx^{n-1}$

$$(x^n)'=nx^{n-1}$$

Odredite derivaciju funkcije $y = \log_5 (5^x - x^5)$.

$$y' = \frac{1}{(5^x - x^5) \ln 5} \cdot (5^x - x^5)' = \frac{5^x \ln 5 - 5x^4}{(5^x - x^5) \ln 5}$$

$$\left(\log_a(\text{nešto})\right)' = \frac{1}{\text{nešto} \cdot \ln a} \cdot (\text{nešto})'$$
 $\left(\log_a x\right)' = \frac{1}{x \ln a}$

$$(\log_a x)' = \frac{1}{x \ln a}$$

dvanaesti zadatak

Odredite derivacije funkcija $f(x) = \ln 5x$, $g(x) = \ln x^5$ i $h(x) = \ln^5 x$.

$$((\text{nešto})^n)' = n(\text{nešto})^{n-1} \cdot (\text{nešto})'$$

$$(x^n)' = nx^{n-1}$$

Odredite derivacije funkcija $f(x) = \ln 5x$, $g(x) = \ln x^5$ i $h(x) = \ln^5 x$.

$$f(x) = \ln 5x$$

$$f'(x) =$$

$$\left(\ln\left(\text{nešto}\right)\right)' = \frac{1}{\text{nešto}} \cdot (\text{nešto})' \left[(\ln x)' = \frac{1}{x} \right]$$

$$((\text{nešto})^n)' = n(\text{nešto})^{n-1} \cdot (\text{nešto})'$$

$$(x^n)' = nx^{n-1}$$

Odredite derivacije funkcija $f(x) = \ln 5x$, $g(x) = \ln x^5$ i $h(x) = \ln^5 x$.

$$f(x) = \ln 5x$$

$$f'(x) = \frac{1}{5x}$$

$$\left(\ln\left(\text{nešto}\right)\right)' = \frac{1}{\text{nešto}} \cdot (\text{nešto})'$$
 $\left(\ln x\right)' = \frac{1}{x}$

$$((\text{nešto})^n)' = n(\text{nešto})^{n-1} \cdot (\text{nešto})'$$

$$(x^n)' = nx^{n-1}$$

Odredite derivacije funkcija $f(x) = \ln 5x$, $g(x) = \ln x^5$ i $h(x) = \ln^5 x$.

$$f(x) = \ln 5x$$

$$I(\lambda) = 1113$$

$$f'(x) = \frac{1}{5x} \cdot$$

$$\left(\ln\left(\text{nešto}\right)\right)' = \frac{1}{\text{nešto}} \cdot \left(\text{nešto}\right)'$$
 $\left(\ln x\right)' = \frac{1}{x}$

$$\boxed{\left((\text{nešto})^n\right)' = n(\text{nešto})^{n-1} \cdot (\text{nešto})'} \boxed{\left(x^n\right)' = nx^{n-1}}$$

Odredite derivacije funkcija $f(x) = \ln 5x$, $g(x) = \ln x^5$ i $h(x) = \ln^5 x$.

$$f(x) = \ln 5x$$

$$f'(x) = \frac{1}{5x} \cdot (5x)'$$

$$\left(\ln\left(\text{nešto}\right)\right)' = \frac{1}{\text{nešto}} \cdot (\text{nešto})' \quad \left(\ln x\right)' = \frac{1}{x}$$

$$\boxed{\left((\text{nešto})^n\right)' = n(\text{nešto})^{n-1} \cdot (\text{nešto})'} \boxed{(x^n)' = nx^{n-1}}$$

Odredite derivacije funkcija $f(x) = \ln 5x$, $g(x) = \ln x^5$ i $h(x) = \ln^5 x$.

$$f(x) = \ln 5x$$

$$f'(x) = \frac{1}{5x} \cdot (5x)'$$
$$f'(x) = \frac{1}{5x}$$

$$\left(\ln\left(\text{nešto}\right)\right)' = \frac{1}{\text{nešto}} \cdot \left(\text{nešto}\right)' \quad \left(\ln x\right)' = \frac{1}{x}$$

$$((\text{nešto})^n)' = n(\text{nešto})^{n-1} \cdot (\text{nešto})'$$

$$(x^n)' = nx^{n-1}$$

Odredite derivacije funkcija $f(x) = \ln 5x$, $g(x) = \ln x^5$ i $h(x) = \ln^5 x$.

$$f(x) = \ln 5x$$

$$f'(x) = \frac{1}{5x} \cdot (5x)'$$
$$f'(x) = \frac{1}{5x} \cdot 5$$

$$\left(\ln\left(\text{nešto}\right)\right)' = \frac{1}{\text{nešto}} \cdot (\text{nešto})' \quad \left(\ln x\right)' = \frac{1}{x}$$

$$((\text{nešto})^n)' = n(\text{nešto})^{n-1} \cdot (\text{nešto})'$$

$$(x^n)' = nx^{n-1}$$

Odredite derivacije funkcija $f(x) = \ln 5x$, $g(x) = \ln x^5$ i $h(x) = \ln^5 x$.

$$f(x) = \ln 5x$$

$$f'(x) = \frac{1}{5x} \cdot (5x)'$$

$$f'(x) = \frac{1}{5x} \cdot 5$$

$$f'(x) = \frac{1}{x}$$

$$\left(\ln\left(\text{nešto}\right)\right)' = \frac{1}{\text{nešto}} \cdot (\text{nešto})' \quad \left(\ln x\right)' = \frac{1}{x}$$

12
$$\frac{\left((\text{nešto})^n \right)' = n(\text{nešto})^{n-1} \cdot (\text{nešto})'}{\left((x^n)' = nx^{n-1} \right)}$$

Odredite derivacije funkcija $f(x) = \ln 5x$, $g(x) = \ln x^5$ i $h(x) = \ln^5 x$.

$$f(x) = \ln 5x$$

$$g(x) = \ln x^5$$

$$f'(x) = \frac{1}{5x} \cdot (5x)' \qquad g'(x) =$$

$$=\frac{1}{5x}\cdot (5)$$

$$f'(x) = \frac{1}{5x} \cdot 5$$

$$f'(x) = \frac{1}{x}$$

$$\left(\ln\left(\text{nešto}\right)\right)' = \frac{1}{\text{nešto}} \cdot (\text{nešto})' \quad \left(\ln x\right)' = \frac{1}{x}$$

$$=\frac{1}{x}$$

$$\frac{\left((\text{nešto})^n \right)' = n(\text{nešto})^{n-1} \cdot (\text{nešto})'}{\left((\text{nešto})^n \right)' = n(\text{nešto})^{n-1} \cdot (\text{nešto})'}$$

Odredite derivacije funkcija $f(x) = \ln 5x$, $g(x) = \ln x^5$ i $h(x) = \ln^5 x$.

$$f(x) = \ln 5x$$

$$g(x) = \ln x^5$$

$$f'(x) = \frac{1}{5x} \cdot (5x)'$$
 $g'(x) = \frac{1}{x^5}$

$$g'(x) =$$

$$f'(x) = \frac{1}{5x} \cdot 5$$

$$=\frac{1}{5x}\cdot 5$$

$$f'(x) = \frac{1}{x}$$

$$\left(\ln\left(\text{nešto}\right)\right)' = \frac{1}{\text{nešto}} \cdot (\text{nešto})' \quad \left(\ln x\right)' = \frac{1}{x}$$

$$\frac{\left((\text{nešto})^n\right)' = n(\text{nešto})^{n-1} \cdot (\text{nešto})'}{\left((x^n)' = nx^{n-1}\right)}$$

Odredite derivacije funkcija $f(x) = \ln 5x$, $g(x) = \ln x^5$ i $h(x) = \ln^5 x$.

$$f(x) = \ln 5x$$

$$g(x) = \ln x^5$$

$$f'(x)=\frac{1}{5x}$$

$$f'(x) = \frac{1}{5x} \cdot (5x)'$$
 $g'(x) = \frac{1}{x^5}$

$$f'(x) = \frac{1}{5x} \cdot 5$$

$$=\frac{1}{5x}\cdot 5$$

$$f'(x) = \frac{1}{5x}$$

$$f'(x) = \frac{1}{x}$$

$$\left(\ln\left(\text{nešto}\right)\right)' = \frac{1}{\text{nešto}} \cdot \left(\text{nešto}\right)' \left| \left(\ln x\right)' = \frac{1}{x} \right|$$

12
$$\frac{\left((\text{nešto})^n \right)' = n(\text{nešto})^{n-1} \cdot (\text{nešto})'}{\left((x^n)' = nx^{n-1} \right)}$$

Odredite derivacije funkcija $f(x) = \ln 5x$, $g(x) = \ln x^5$ i $h(x) = \ln^5 x$.

$$f(x) = \ln 5x$$

$$5x g(x) = \ln x^5$$

$$f(x) = \frac{1}{1}$$

$$\sigma'(x) = \frac{1}{x}$$

$$f'(x) = \frac{1}{5x} \cdot (5x)'$$
 $g'(x) = \frac{1}{x^5} \cdot (x^5)'$

$$(5x)^{\prime}$$

$$f'(x) = \frac{1}{5x} \cdot 5$$

$$-\frac{1}{5x}$$

$$=\frac{1}{-}$$

$$f'(x) = \frac{1}{x}$$

$$\left(\ln\left(\text{nešto}\right)\right)' = \frac{1}{\text{nešto}} \cdot \left(\text{nešto}\right)' \quad \left(\ln x\right)' = \frac{1}{x}$$

$$=\frac{1}{1}$$

12
$$\frac{\left((\text{nešto})^n \right)' = n(\text{nešto})^{n-1} \cdot (\text{nešto})'}{\left((\text{nešto})^n \right)' = nx^{n-1}}$$

Odredite derivacije funkcija $f(x) = \ln 5x$, $g(x) = \ln x^5$ i $h(x) = \ln^5 x$.

$$f(x) = \ln 5x$$
$$f'(x) = \frac{1}{1}$$

$$g(x) = \ln x^5$$

$$f'(x)=\frac{1}{5x}$$

$$f'(x) = \frac{1}{5x} \cdot (5x)'$$
 $g'(x) = \frac{1}{x^5} \cdot (x^5)'$

$$f'(x) = \frac{1}{5x} \cdot 5$$

$$g'(x) = \frac{1}{x^5}$$

$$f'(x) = \frac{1}{x}$$

$$T(X) = \frac{1}{X}$$

$$\left(\ln\left(\text{nešto}\right)\right)' = \frac{1}{\text{nešto}} \cdot \left(\text{nešto}\right)' \quad \left(\ln x\right)' = \frac{1}{x}$$

12
$$\frac{\left((\text{nešto})^n \right)' = n(\text{nešto})^{n-1} \cdot (\text{nešto})'}{\left((x^n)' = nx^{n-1} \right)}$$

Odredite derivacije funkcija $f(x) = \ln 5x$, $g(x) = \ln x^5$ i $h(x) = \ln^5 x$.

Rješenje

$$f(x) = \ln 5x$$

$$g(x) = \ln x^5$$

$$f'(x)$$
 1

$$f'(x) = \frac{1}{x}$$

$$f'(x) = \frac{1}{5x} \cdot (5x)'$$
 $g'(x) = \frac{1}{x^5} \cdot (x^5)'$

$$g'(x) =$$

$$f'(x) = \frac{1}{5x} \cdot 5$$

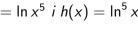
$$f'(x) = \frac{1}{x}$$

 $\left(\ln\left(\text{nešto}\right)\right)' = \frac{1}{\text{nešto}} \cdot \left(\text{nešto}\right)' \left| \left(\ln x\right)' = \frac{1}{x} \right|$

$$g'(x) = \frac{1}{x^5} \cdot 5x^4$$

$$(x^5)'$$

$$(x^5)'$$



12
$$\frac{\left((\text{nešto})^n \right)' = n(\text{nešto})^{n-1} \cdot (\text{nešto})'}{\left((x^n)' = nx^{n-1} \right)}$$

Odredite derivacije funkcija $f(x) = \ln 5x$, $g(x) = \ln x^5$ i $h(x) = \ln^5 x$.

$$f(x) = \ln 5x \qquad g(x) = \ln x^5$$

$$f'(x) = \frac{1}{5x} \cdot (5x)'$$
 $g'(x) = \frac{1}{x^5} \cdot (x^5)'$ $g'(x) = \frac{1}{x^5} \cdot 5x^4$

$$f'(x) = \frac{1}{5x} \cdot 5$$

$$g'(x) = \frac{1}{x^5}$$

$$f'(x) = \frac{1}{x}$$

$$g'(x) = \frac{5}{x}$$

$$=\frac{5}{x}$$

$$'=\frac{1}{2}$$

12
$$\frac{\left((\text{nešto})^n \right)' = n(\text{nešto})^{n-1} \cdot (\text{nešto})'}{\left((x^n)' = nx^{n-1} \right)}$$

Odredite derivacije funkcija $f(x) = \ln 5x$, $g(x) = \ln x^5$ i $h(x) = \ln^5 x$.

Rješenje
$$f(x) = \ln 5x$$

$$g(x) = \ln x^{5}$$

$$f'(x) = \frac{1}{5x} \cdot (5x)'$$

$$g'(x) = \frac{1}{x^{5}} \cdot (x^{5})'$$

$$f'(x) = \frac{1}{5x} \cdot 5$$

$$g'(x) = \frac{1}{x^{5}} \cdot 5x^{4}$$

$$f'(x) = \frac{1}{x}$$

$$g'(x) = \frac{5}{x}$$

 $h(x) = \ln^5 x$

12
$$\frac{\left((\text{nešto})^n \right)' = n(\text{nešto})^{n-1} \cdot (\text{nešto})'}{\left((x^n)' = nx^{n-1} \right)}$$

Odredite derivacije funkcija $f(x) = \ln 5x$, $g(x) = \ln x^5$ i $h(x) = \ln^5 x$.

Rješenje
$$f(x) = \ln 5x \qquad \qquad g(x) = \ln x^5 \qquad \qquad h(x) = \ln^5 x$$

 $f(x) = \ln 5x$

$$g(x) = \ln \frac{1}{(5x)'}$$
 $g'(x) = \frac{1}{(5x)'}$

$$g(x) = \ln x^5$$
 $h(x^5)'$

$$f'(x) = \frac{1}{5x} \cdot (5x)'$$
 $g'(x) = \frac{1}{x^5} \cdot (x^5)'$ $f'(x) = \frac{1}{5x} \cdot 5$ $g'(x) = \frac{1}{x^5} \cdot 5x^4$

$$g'(x) = \frac{1}{x^5} \cdot 5x^4$$

$$g'(x) = \frac{5}{x}$$

$$g'(x) = \frac{1}{2}$$

$$h(x) = (\ln x)^5$$

$$\left(\ln\left(\text{nešto}\right)\right)' = \frac{1}{\text{nešto}} \cdot \left(\text{nešto}\right)' \quad \left(\ln x\right)' = \frac{1}{x} \quad \left[\ln^k x = (\ln x)^k\right]$$

12
$$\frac{\left((\text{nešto})^n\right)' = n(\text{nešto})^{n-1} \cdot (\text{nešto})'}{\left((x^n)' = nx^{n-1}\right)}$$

Odredite derivacije funkcija $f(x) = \ln 5x$, $g(x) = \ln x^5$ i $h(x) = \ln^5 x$.

 $f(x) = \ln 5x$

$$g(x) = \ln x$$

$$g(x) = \ln x^5$$
 $h(x) = \ln^5 x$
 $g'(x) = \frac{1}{1 + (x^5)^4}$ $h(x) = (\ln x)^5$

$$f'(x) = \frac{1}{5x} \cdot (5x)'$$

 $f'(x) = \frac{1}{5x} \cdot 5$

$$g'(x) = \frac{1}{x^5} \cdot \left(x^5\right)'$$

$$g'(x) = \frac{1}{x^5} \cdot (x')$$
$$g'(x) = \frac{1}{x^5} \cdot 5x^4$$

$$5x^4$$

$$g'(x) = \frac{5}{x^5} \cdot 5x$$

$$h'(x) =$$

$$f'(x) = \frac{1}{x} \qquad \qquad g'(x) = \frac{5}{x}$$

$$\left(\ln\left(\text{nešto}\right)\right)' = \frac{1}{\text{nešto}} \cdot \left(\text{nešto}\right)' \left[(\ln x)' = \frac{1}{x} \right] \left[\ln^k x = (\ln x)^k \right]$$

12
$$\frac{\left((\text{nešto})^n \right)' = n(\text{nešto})^{n-1} \cdot (\text{nešto})'}{\left((x^n)' = nx^{n-1} \right)}$$

Odredite derivacije funkcija $f(x) = \ln 5x$, $g(x) = \ln x^5$ i $h(x) = \ln^5 x$.

Rješenje
$$f(x) = \ln 5x \qquad \qquad g(x) = \ln x^5 \qquad \qquad h(x) = \ln^5 x$$

Rješenje
$$f(x) = \ln 5x \qquad g(x) = \ln x^5 \qquad h(x) = \ln^5 x$$

$$g'(x) = \frac{1}{x^5} \cdot (x^5)'$$

$$g'(x) = \frac{1}{x^5} \cdot 5x^4$$

$$g'(x) = \frac{5}{x}$$

 $f'(x) = \frac{1}{5x} \cdot 5$ $f'(x) = \frac{1}{x}$

 $f'(x) = \frac{1}{5x} \cdot (5x)'$

 $\left(\ln\left(\text{nešto}\right)\right)' = \frac{1}{\text{nešto}} \cdot \left(\text{nešto}\right)' \left| \left(\ln x\right)' = \frac{1}{x} \left| \left[\ln^k x = (\ln x)^k\right] \right|$

 $h(x) = (\ln x)^5$

 $h'(x) = 5 (\ln x)^4$

12
$$\frac{\left((\text{nešto})^n \right)' = n(\text{nešto})^{n-1} \cdot (\text{nešto})'}{\left((\text{nešto})^n \right)'} = \frac{\left((\text{nešto})^n \right)' = n(\text{nešto})^{n-1}}{\left((\text{nešto})^n \right)'} = \frac{1}{n}$$

Odredite derivacije funkcija $f(x) = \ln 5x$, $g(x) = \ln x^5$ i $h(x) = \ln^5 x$.

Rješenje

$$f(x) = \ln 5x$$

$$g(x) = \ln x^{5}$$

$$g'(x) = \frac{1}{x^{5}} \cdot (x^{5})'$$

$$f'(x) = \frac{1}{5x} \cdot (5x)'$$

$$g'(x) = \frac{1}{x^5} \cdot 5x^4$$

$$g'(x) = \frac{5}{x}$$

$$(x^5)'$$

$$h'(x) = 5 \left(\ln x \right)^4 \, \cdot$$

 $h(x) = \ln^5 x$

$$h(x) = (\ln x)^5$$
$$h'(x) = 5(\ln x)^4 \cdot$$

$$\left(\ln\left(\text{nešto}\right)\right)' = \frac{1}{\text{nešto}} \cdot \left(\text{nešto}\right)' \quad \left(\ln x\right)' = \frac{1}{x} \quad \left[\ln^k x = (\ln x)^k\right]$$

$$f'(x) = \frac{1}{5x} \cdot 5$$
$$f'(x) = \frac{1}{x}$$

Odredite derivacije funkcija $f(x) = \ln 5x$, $g(x) = \ln x^5$ i $h(x) = \ln^5 x$.

Rješenje

$$f(x) = \ln 5x$$

$$g(x) = \ln x^5 \qquad h(x) = \ln^5 x$$

 $f'(x) = \frac{1}{5x} \cdot (5x)'$

 $f'(x) = \frac{1}{5x} \cdot 5$

 $f'(x)=\frac{1}{x}$

$$g'(x) = \frac{1}{x^5} \cdot \left(x^5\right)'$$

$$f(x) = \frac{1}{x^5} \cdot (x^5)$$

$$f(x) = \frac{1}{x^5} \cdot 5x^4$$

$$g'(x) = \frac{1}{x^5} \cdot 5x^4$$
$$g'(x) = \frac{5}{x}$$

$$h'(x) = (\ln x)^4 \cdot (\ln x)^4$$

$$h(x) = (\ln x)^5$$

$$h'(x) = 5(\ln x)^4 \cdot (\ln x)^4$$

$$(\ln x)^k$$

12
$$\frac{\left((\text{nešto})^n \right)' = n(\text{nešto})^{n-1} \cdot (\text{nešto})'}{\left((\text{nešto})^n \right)' = nx^{n-1}}$$

Odredite derivacije funkcija $f(x) = \ln 5x$, $g(x) = \ln x^5$ i $h(x) = \ln^5 x$.

Rješenje
$$f(x) = \ln 5x \qquad \qquad g(x) = \ln x^5 \qquad \qquad h(x)$$

Rješenje
$$f(x) = \ln 5x \qquad g(x) = \ln x^5 \qquad h(x) = \ln^5 x$$

$$f'(x) = \frac{1}{5x} \cdot (5x)'$$

$$\cdot (5x)' \qquad g'(x) = \frac{1}{x^5} \cdot (x^5)'$$

$$g'(x) = \frac{1}{x^5} \cdot (x^5)$$
$$g'(x) = \frac{1}{x^5} \cdot 5x^4$$

$$f'(x) = \frac{1}{5x} \cdot 5$$

$$f'(x) = \frac{1}{x}$$

$$g'(x) = \frac{1}{x^5}$$

$$g'(x) = \frac{5}{x}$$

$$h'(x) = 5 (\ln x)^4 \cdot (\ln x)^4$$

 $h'(x) = 5 (\ln x)^4$

$$h'(x) = 5\left(\ln x\right)^4$$

 $h(x) = (\ln x)^5$

$$f'(x) = \frac{1}{x}$$

$$g'(x) = \frac{5}{x}$$

$$\left(\ln\left(\text{nešto}\right)\right)' = \frac{1}{\text{nešto}} \cdot \left(\text{nešto}\right)'$$

$$\left(\ln x\right)' = \frac{1}{x}$$

$$\ln^k x = (\ln x)^k$$

Odredite derivacije funkcija $f(x) = \ln 5x$, $g(x) = \ln x^5$ i $h(x) = \ln^5 x$.

Rješenje

$$f(x) = \ln 5x$$

 $f'(x) = \frac{1}{x}$

$$g(x) = \ln x^5$$

$$f'(x) = \frac{1}{5x} \cdot (5x)'$$
 $g'(x) = \frac{1}{x^5} \cdot (x^5)'$

$$f'(x) = \frac{1}{5x} \cdot (5x)$$
$$f'(x) = \frac{1}{5x} \cdot 5$$

$$g'(x)=\frac{5}{x}$$

$$g'(x) = \frac{1}{x^5} \cdot 5x^4$$



$$h'(x)=5$$

 $h(x) = \ln^5 x$

$$h(x) = (\ln x)^5$$
$$h'(x) = 5(\ln x)$$

$$h'(x) = (\ln x)^4 \cdot (\ln x)'$$

$$\frac{4}{4} \cdot (\ln x)'$$

$$h'(x) = 5 \left(\ln x\right)^4 \cdot \frac{1}{x}$$

$$\left(\ln\left(\text{nešto}\right)\right)' = \frac{1}{\text{nešto}} \cdot \left(\text{nešto}\right)' \quad \left(\ln x\right)' = \frac{1}{x} \quad \left[\ln^k x = (\ln x)^k\right]$$

derivacija funkcija
$$f(x) = \ln F(x) - \ln x^5 + h(x) = \ln^5$$

 $((\text{nešto})^n)' = n(\text{nešto})^{n-1} \cdot (\text{nešto})' \mid (x^n)' = nx^{n-1}$

Odredite derivacije funkcija $f(x) = \ln 5x$, $g(x) = \ln x^5$ i $h(x) = \ln^5 x$.

Rješenje

$$f(x) = \ln 5x$$

 $f'(x) = \frac{1}{5x} \cdot 5$

 $f'(x) = \frac{1}{5x} \cdot (5x)'$

$$g'(x) = \frac{1}{x^5} \cdot \left(x^5\right)'$$

$$g'(x) = \frac{1}{x^5} \cdot (x^5)' \qquad h(x) = (\ln x)^5$$

$$g'(x) = \frac{1}{x^5} \cdot 5x^4 \qquad h'(x) = 5(\ln x)^5$$

$$g'(x) = \frac{1}{x^{t}}$$
$$g'(x) = \frac{5}{x}$$

$$h'(x) = 5 (\ln x)^4 \cdot (\ln x)'$$

 $h'(x) = 5 (\ln x)^4 \cdot \frac{1}{x}$

$$h'(x) = 5 \left(\ln x\right)^4$$
$$h'(x) = \frac{5}{x} \ln^4 x$$

$$h'(x) = \frac{5}{x}$$

$$\frac{5}{x} \ln^4 x$$

$$f'(x) = \frac{1}{x}$$

$$g'(x) = \frac{5}{x}$$

$$h'(x) = \frac{5}{x} \ln^4 x$$

$$\left(\ln\left(\text{nešto}\right)\right)' = \frac{1}{\text{nešto}} \cdot \left(\text{nešto}\right)'$$

$$\left(\ln x\right)' = \frac{1}{x}$$

$$\ln^k x = (\ln x)^k$$

trinaesti zadatak

Odredite derivaciju funkcije $y = \ln \frac{x-1}{x+1}$.

Odredite derivaciju funkcije
$$y = \ln \frac{x-1}{x+1}$$
.

$$(\ln x)' = \frac{1}{x}$$

$$y' =$$

$$\left(\ln \left(\mathsf{ne imesto} \right) \right)' = rac{1}{\mathsf{ne imesto}} \cdot \left(\mathsf{ne imesto} \right)'$$

Odredite derivaciju funkcije
$$y = \ln \frac{x-1}{x+1}$$
.

$$(\ln x)' = \frac{1}{x}$$

$$y' = \frac{1}{\frac{x-1}{x+1}}$$

$$ig(\operatorname{\mathsf{In}} ig(\operatorname{\mathsf{ne ino}}ig)ig)' = rac{1}{\operatorname{\mathsf{ne ino}}} \cdot ig(\operatorname{\mathsf{ne ino}}ig)'$$

Odredite derivaciju funkcije
$$y = \ln \frac{x-1}{x+1}$$
.

$$(\ln x)' = \frac{1}{x}$$

$$y' = \frac{1}{\frac{x-1}{x+1}} \cdot$$

$$\big(\operatorname{ln} \big(\operatorname{nešto} \big) \big)' = \frac{1}{\operatorname{nešto}} \cdot (\operatorname{nešto})'$$

Odredite derivaciju funkcije
$$y = \ln \frac{x-1}{x+1}$$
.

$$(\ln x)' = \frac{1}{x}$$

$$y' = \frac{1}{\frac{x-1}{x+1}} \cdot \left(\frac{x-1}{x+1}\right)'$$

$$\left(\ln\left(\mathsf{ne imesto}
ight)
ight)' = rac{1}{\mathsf{ne imesto}}\cdot\left(\mathsf{ne imesto}
ight)'$$

Odredite derivaciju funkcije
$$y = \ln \frac{x-1}{x+1}$$
.

$$(\ln x)' = \frac{1}{x}$$

$$y' = \frac{1}{\frac{x-1}{x+1}} \cdot \left(\frac{x-1}{x+1}\right)' =$$
$$= \frac{x+1}{x-1}$$

$$\left(\left(\ln \left(\mathsf{ne imesto} \right) \right)' = rac{1}{\mathsf{ne imesto}} \cdot \left(\mathsf{ne imesto} \right)'
ight.$$

Odredite derivaciju funkcije $y = \ln \frac{x-1}{x+1}$.

$$(\ln x)' = \frac{1}{x}$$

$$y' = \frac{1}{\frac{x-1}{x+1}} \cdot \left(\frac{x-1}{x+1}\right)' =$$
$$= \frac{x+1}{x-1}.$$

$$\left(\ln\left(\mathsf{ne imesto}
ight)
ight)' = rac{1}{\mathsf{ne imesto}}\cdot\left(\mathsf{ne imesto}
ight)'$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

Odredite derivaciju funkcije $y = \ln \frac{x-1}{x+1}$.

$$y' = \frac{1}{\frac{x-1}{x+1}} \cdot \left(\frac{x-1}{x+1}\right)' =$$

$$\left(\ln\left(\text{nešto}\right)\right)' = \frac{1}{\text{nešto}} \cdot (\text{nešto})'$$

$$=\frac{x+1}{x-1}\cdot -$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

Odredite derivaciju funkcije $y = \ln \frac{x-1}{x+1}$.

$$y' = \frac{1}{\frac{x-1}{x+1}} \cdot \left(\frac{x-1}{x+1}\right)' =$$

$$\left(\ln\left(\text{nešto}\right)\right)' = \frac{1}{\text{nešto}} \cdot (\text{nešto})'$$

$$=$$
 $\frac{1}{x-1}$ $(x+1)^2$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

Odredite derivaciju funkcije $y = \ln \frac{x-1}{x+1}$.

$$\ln x)' = \frac{1}{x}$$

$$y' = \frac{1}{\frac{x-1}{x+1}} \cdot \left(\frac{x-1}{x+1}\right)' = \frac{\left(\ln\left(\text{nešto}\right)\right)' = \frac{1}{\text{nešto}} \cdot \left(\text{nešto}\right)'}{= \frac{x+1}{x-1} \cdot \frac{(x-1)'}{(x+1)^2}}$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

Odredite derivaciju funkcije $y = \ln \frac{x-1}{x+1}$.

$$(\ln x)' = \frac{1}{x}$$

$$y' = rac{1}{rac{x-1}{x+1}} \cdot \left(rac{x-1}{x+1}
ight)' = rac{\left(\ln\left(ext{nešto}
ight)
ight)' = rac{1}{ ext{nešto}} \cdot \left(ext{nešto}
ight)'}{= rac{x+1}{x-1}} \cdot rac{\left(x-1
ight)' \cdot \left(x+1
ight)^2}{= rac{x+1}{x-1}}$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

Odredite derivaciju funkcije $y = \ln \frac{x-1}{x+1}$.

$$(\ln x)' = \frac{1}{x}$$

$$y' = \frac{1}{\frac{x-1}{x+1}} \cdot \left(\frac{x-1}{x+1}\right)' = \frac{\left(\ln\left(\text{nešto}\right)\right)' = \frac{1}{\text{nešto}} \cdot \left(\text{nešto}\right)'}{= \frac{x+1}{x-1} \cdot \frac{(x-1)' \cdot (x+1)}{(x+1)^2}}$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

Odredite derivaciju funkcije $y = \ln \frac{x-1}{x+1}$.

$$(\ln x)' = \frac{1}{x}$$

$$y' = \frac{1}{\frac{x-1}{x+1}} \cdot \left(\frac{x-1}{x+1}\right)' = \frac{\left(\ln\left(\text{nešto}\right)\right)' = \frac{1}{\text{nešto}} \cdot \left(\text{nešto}\right)'}{= \frac{x+1}{x-1}} \cdot \frac{\left(x-1\right)' \cdot \left(x+1\right) - \left(x+1\right)^2}{= \frac{x+1}{x-1}}$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

Odredite derivaciju funkcije $y = \ln \frac{x-1}{x+1}$.

$$y' = \frac{1}{\frac{x-1}{x+1}} \cdot \left(\frac{x-1}{x+1}\right)' = \frac{\left(\ln\left(\text{nešto}\right)\right)' = \frac{1}{\text{nešto}} \cdot \left(\text{nešto}\right)'}{= \frac{x+1}{x-1}} \cdot \frac{\left(x-1\right)' \cdot \left(x+1\right) - \left(x-1\right)}{(x+1)^2}$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

Odredite derivaciju funkcije $y = \ln \frac{x-1}{x+1}$.

$$(\ln x)' = \frac{1}{x}$$

$$y' = \frac{1}{\frac{x-1}{x+1}} \cdot \left(\frac{x-1}{x+1}\right)' = \frac{\left(\ln\left(\text{nešto}\right)\right)' = \frac{1}{\text{nešto}} \cdot \left(\text{nešto}\right)'}{= \frac{x+1}{x-1}} \cdot \frac{\left(x-1\right)' \cdot \left(x+1\right) - \left(x-1\right) \cdot \left(x+1\right)^2}{(x+1)^2}$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

Odredite derivaciju funkcije $y = \ln \frac{x-1}{x+1}$.

$$y' = \frac{1}{\frac{x-1}{x+1}} \cdot \left(\frac{x-1}{x+1}\right)' = \frac{\left(\ln\left(\text{nešto}\right)\right)' = \frac{1}{\text{nešto}} \cdot \left(\text{nešto}\right)'}{= \frac{x+1}{x-1}} \cdot \frac{\left(x-1\right)' \cdot \left(x+1\right) - \left(x-1\right) \cdot \left(x+1\right)'}{(x+1)^2}$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

Odredite derivaciju funkcije $y = \ln \frac{x-1}{x+1}$.

$$y' = \frac{1}{\frac{x-1}{x+1}} \cdot \left(\frac{x-1}{x+1}\right)' = \frac{\left(\ln(\text{nešto})\right)' = \frac{1}{\text{nešto}} \cdot (\text{nešto})'}{= \frac{x+1}{x-1}} = \frac{x+1}{x-1} \cdot \frac{(x-1)' \cdot (x+1) - (x-1) \cdot (x+1)'}{(x+1)^2} = \frac{x+1}{x-1}$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

Odredite derivaciju funkcije $y = \ln \frac{x-1}{x+1}$.

$$y' = \frac{1}{\frac{x-1}{x+1}} \cdot \left(\frac{x-1}{x+1}\right)' = \frac{\left(\ln\left(\text{nešto}\right)\right)' = \frac{1}{\text{nešto}} \cdot \left(\text{nešto}\right)'}{\text{nešto}}$$

$$= \frac{x+1}{x-1} \cdot \frac{(x-1)' \cdot (x+1) - (x-1) \cdot (x+1)'}{(x+1)^2} =$$

$$= \frac{x+1}{x-1} \cdot$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

Odredite derivaciju funkcije $y = \ln \frac{x-1}{x+1}$.

$$(\ln x)' = \frac{1}{x}$$

$$y' = \frac{1}{\frac{x-1}{x+1}} \cdot \left(\frac{x-1}{x+1}\right)' = \frac{\left(\ln(\text{nešto})\right)' = \frac{1}{\text{nešto}} \cdot (\text{nešto})'}{}$$

$$= \frac{x+1}{x-1} \cdot \frac{(x-1)' \cdot (x+1) - (x-1) \cdot (x+1)'}{(x+1)^2} =$$

$$= \frac{x+1}{x-1} \cdot \frac{(x-1)' \cdot (x+1) - (x-1) \cdot (x+1)'}{(x+1)^2} =$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

Odredite derivaciju funkcije $y = \ln \frac{x-1}{x+1}$.

$$(\ln x)' = \frac{1}{x}$$

$$y' = \frac{1}{\frac{x-1}{x+1}} \cdot \left(\frac{x-1}{x+1}\right)' = \frac{\left(\ln(\text{nešto})\right)' = \frac{1}{\text{nešto}} \cdot (\text{nešto})'}{\text{nešto}}$$

$$= \frac{x+1}{x-1} \cdot \frac{(x-1)' \cdot (x+1) - (x-1) \cdot (x+1)'}{(x+1)^2} =$$

$$= \frac{x+1}{x-1} \cdot \frac{(x+1)^2}{(x+1)^2}$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

Odredite derivaciju funkcije $y = \ln \frac{x-1}{x+1}$.

$$(\ln x)' = \frac{1}{x}$$

$$y' = \frac{1}{\frac{x-1}{x+1}} \cdot \left(\frac{x-1}{x+1}\right)' = \frac{\left(\ln(\text{nešto})\right)' = \frac{1}{\text{nešto}} \cdot (\text{nešto})'}{\text{nešto}}$$

$$= \frac{x+1}{x-1} \cdot \frac{(x-1)' \cdot (x+1) - (x-1) \cdot (x+1)'}{(x+1)^2} =$$

$$= \frac{x+1}{x-1} \cdot \frac{1}{(x+1)^2}$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

Odredite derivaciju funkcije $y = \ln \frac{x-1}{x+1}$.

$$(\ln x)' = \frac{1}{x}$$

$$y' = \frac{1}{\frac{x-1}{x+1}} \cdot \left(\frac{x-1}{x+1}\right)' = \frac{\left(\ln(\text{nešto})\right)' = \frac{1}{\text{nešto}} \cdot (\text{nešto})'}{\text{nešto}}$$

$$= \frac{x+1}{x-1} \cdot \frac{(x-1)' \cdot (x+1) - (x-1) \cdot (x+1)'}{(x+1)^2} =$$

$$= \frac{x+1}{x-1} \cdot \frac{1}{(x+1)^2}$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

Odredite derivaciju funkcije $y = \ln \frac{x-1}{x+1}$.

$$y' = \frac{1}{\frac{x-1}{x+1}} \cdot \left(\frac{x-1}{x+1}\right)' = \frac{\left(\ln(\text{nešto})\right)' = \frac{1}{\text{nešto}} \cdot (\text{nešto})'}{\text{nešto}}$$

$$= \frac{x+1}{x-1} \cdot \frac{(x-1)' \cdot (x+1) - (x-1) \cdot (x+1)'}{(x+1)^2} =$$

$$= \frac{x+1}{x-1} \cdot \frac{1 \cdot (x+1)}{(x+1)^2}$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

Odredite derivaciju funkcije $y = \ln \frac{x-1}{x+1}$.

$$y' = \frac{1}{\frac{x-1}{x+1}} \cdot \left(\frac{x-1}{x+1}\right)' = \frac{\left(\ln(\text{nešto})\right)' = \frac{1}{\text{nešto}} \cdot (\text{nešto})'}{\text{nešto}}$$

$$= \frac{x+1}{x-1} \cdot \frac{(x-1)' \cdot (x+1) - (x-1) \cdot (x+1)'}{(x+1)^2} =$$

$$= \frac{x+1}{x-1} \cdot \frac{1 \cdot (x+1) - (x+1)'}{(x+1)^2}$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

Odredite derivaciju funkcije $y = \ln \frac{x-1}{x+1}$.

$$(\ln x)' = \frac{1}{x}$$

$$y' = \frac{1}{\frac{x-1}{x+1}} \cdot \left(\frac{x-1}{x+1}\right)' = \frac{\left(\ln(\text{nešto})\right)' = \frac{1}{\text{nešto}} \cdot (\text{nešto})'}{\text{nešto}}$$

$$= \frac{x+1}{x-1} \cdot \frac{(x-1)' \cdot (x+1) - (x-1) \cdot (x+1)'}{(x+1)^2} =$$

$$= \frac{x+1}{x-1} \cdot \frac{1 \cdot (x+1) - (x-1)}{(x+1)^2}$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

Odredite derivaciju funkcije $y = \ln \frac{x-1}{x+1}$.

$$(\ln x)' = \frac{1}{x}$$

$$y' = \frac{1}{\frac{x-1}{x+1}} \cdot \left(\frac{x-1}{x+1}\right)' = \frac{\left(\ln(\text{nešto})\right)' = \frac{1}{\text{nešto}} \cdot (\text{nešto})'}{\text{nešto}}$$

$$= \frac{x+1}{x-1} \cdot \frac{(x-1)' \cdot (x+1) - (x-1) \cdot (x+1)'}{(x+1)^2} =$$

$$= \frac{x+1}{x-1} \cdot \frac{1 \cdot (x+1) - (x-1) \cdot (x+1)'}{(x+1)^2}$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

Odredite derivaciju funkcije $y = \ln \frac{x-1}{x+1}$.

$$(\ln x)' = \frac{1}{x}$$

$$y' = \frac{1}{\frac{x-1}{x+1}} \cdot \left(\frac{x-1}{x+1}\right)' = \frac{\left(\ln(\text{nešto})\right)' = \frac{1}{\text{nešto}} \cdot (\text{nešto})'}{\text{nešto}}$$

$$= \frac{x+1}{x-1} \cdot \frac{(x-1)' \cdot (x+1) - (x-1) \cdot (x+1)'}{(x+1)^2} =$$

$$= \frac{x+1}{x-1} \cdot \frac{1 \cdot (x+1) - (x-1) \cdot 1}{(x+1)^2}$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

Odredite derivaciju funkcije $y = \ln \frac{x-1}{x+1}$.

$$(\ln x)' = \frac{1}{x}$$

$$y' = \frac{1}{\frac{x-1}{x+1}} \cdot \left(\frac{x-1}{x+1}\right)' = \frac{\left(\ln\left(\text{nešto}\right)\right)' = \frac{1}{\text{nešto}} \cdot \left(\text{nešto}\right)'}{\text{nešto}}$$

$$= \frac{x+1}{x-1} \cdot \frac{(x-1)' \cdot (x+1) - (x-1) \cdot (x+1)'}{(x+1)^2} =$$

$$= \frac{x+1}{x-1} \cdot \frac{1 \cdot (x+1) - (x-1) \cdot 1}{(x+1)^2} = -\frac{1}{\text{nešto}} \cdot \frac{1}{\text{nešto}} \cdot \frac{1}{\text{nešto}}$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

Odredite derivaciju funkcije $y = \ln \frac{x-1}{x+1}$.

$$(\ln x)' = \frac{1}{x}$$

$$y' = \frac{1}{\frac{x-1}{x+1}} \cdot \left(\frac{x-1}{x+1}\right)' = \frac{\left(\ln(\text{nešto})\right)' = \frac{1}{\text{nešto}} \cdot (\text{nešto})'}{\text{nešto}}$$

$$= \frac{x+1}{x-1} \cdot \frac{(x-1)' \cdot (x+1) - (x-1) \cdot (x+1)'}{(x+1)^2} =$$

$$= \frac{x+1}{x-1} \cdot \frac{1 \cdot (x+1) - (x-1) \cdot 1}{(x+1)^2} = \frac{(x-1)(x+1)}{(x+1)^2}$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

Odredite derivaciju funkcije $y = \ln \frac{x-1}{x+1}$.

$$(\ln x)' = \frac{1}{x}$$

$$y' = \frac{1}{\frac{x-1}{x+1}} \cdot \left(\frac{x-1}{x+1}\right)' = \frac{\left(\ln\left(\text{nešto}\right)\right)' = \frac{1}{\text{nešto}} \cdot \left(\text{nešto}\right)'}{\text{nešto}}$$

$$= \frac{x+1}{x-1} \cdot \frac{(x-1)' \cdot (x+1) - (x-1) \cdot (x+1)'}{(x+1)^2} =$$

$$= \frac{x+1}{x-1} \cdot \frac{1 \cdot (x+1) - (x-1) \cdot 1}{(x+1)^2} = \frac{2}{(x-1)(x+1)}$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$

Odredite derivaciju funkcije $y = \ln \frac{x-1}{x+1}$.

$$(\ln x)' = \frac{1}{x}$$

$$y' = \frac{1}{\frac{x-1}{x+1}} \cdot \left(\frac{x-1}{x+1}\right)' = \frac{\left(\ln\left(\text{nešto}\right)\right)' = \frac{1}{\text{nešto}} \cdot \left(\text{nešto}\right)'}{\left(x+1\right)'}$$

$$= \frac{x+1}{x-1} \cdot \frac{(x-1)' \cdot (x+1) - (x-1) \cdot (x+1)'}{(x+1)^2} =$$

$$= \frac{x+1}{x-1} \cdot \frac{1 \cdot (x+1) - (x-1) \cdot 1}{(x+1)^2} = \frac{2}{(x-1)(x+1)} = \frac{2}{x^2-1}$$

$$\left(\frac{u}{v}\right)'(x) = \frac{u'(x) \cdot v(x) - u(x) \cdot v'(x)}{v(x)^2}$$



četrnaesti zadatak

Odredite derivaciju funkcije $y = \sqrt{\sin(x^2 - 1)}$.

Odredite derivaciju funkcije $y = \sqrt{\sin(x^2 - 1)}$.

$(\sqrt{x})' = \frac{1}{2\sqrt{x}}$

$$y' =$$

$$\left(\sqrt{\mathsf{ne ilde{s}to}}\,
ight)' = rac{1}{2\sqrt{\mathsf{ne ilde{s}to}}} \cdot (\mathsf{ne ilde{s}to})'$$

Odredite derivaciju funkcije $y = \sqrt{\sin(x^2 - 1)}$.

$(\sqrt{x})' = \frac{1}{2\sqrt{x}}$

$$y' = \frac{1}{2\sqrt{\sin\left(x^2 - 1\right)}}$$

$$\left(\sqrt{\mathsf{ne ilde{s}to}}\,
ight)' = rac{1}{2\sqrt{\mathsf{ne ilde{s}to}}} \cdot (\mathsf{ne ilde{s}to})'$$

Odredite derivaciju funkcije $y = \sqrt{\sin(x^2 - 1)}$.

$(\sqrt{x})' = \frac{1}{2\sqrt{x}}$

$$y' = \frac{1}{2\sqrt{\sin\left(x^2 - 1\right)}} \cdot$$

$$\left(\sqrt{\mathsf{ne ilde{s}to}}\,
ight)' = rac{1}{2\sqrt{\mathsf{ne ilde{s}to}}} \cdot (\mathsf{ne ilde{s}to})'$$

Odredite derivaciju funkcije $y = \sqrt{\sin(x^2 - 1)}$.

$(\sqrt{x}\,)'=\frac{1}{2\sqrt{x}}$

$$y' = \frac{1}{2\sqrt{\sin(x^2 - 1)}} \cdot \left(\sin(x^2 - 1)\right)'$$

$$\left(\sqrt{\mathsf{ne ilde{s}to}}\,
ight)' = rac{1}{2\sqrt{\mathsf{ne ilde{s}to}}} \cdot (\mathsf{ne ilde{s}to})'$$

Odredite derivaciju funkcije $y = \sqrt{\sin(x^2 - 1)}$.

$(\sqrt{x})' = \frac{1}{2\sqrt{x}}$

$$y' = \frac{1}{2\sqrt{\sin(x^2 - 1)}} \cdot \left(\sin(x^2 - 1)\right)' =$$
$$= \frac{1}{2\sqrt{\sin(x^2 - 1)}}$$

$$\left(\sqrt{\mathsf{ne ilde{s}to}}\,
ight)' = rac{1}{2\sqrt{\mathsf{ne ilde{s}to}}} \cdot (\mathsf{ne ilde{s}to})'$$

Odredite derivaciju funkcije $y = \sqrt{\sin(x^2 - 1)}$.

Rješenje

$$y' = \frac{1}{2\sqrt{\sin(x^2 - 1)}} \cdot \left(\sin(x^2 - 1)\right)' =$$
$$= \frac{1}{2\sqrt{\sin(x^2 - 1)}} \cdot$$

$$(\sqrt{x})' = \frac{1}{2\sqrt{x}}$$

$$\left(\sqrt{\mathsf{ne ilde{s}to}}\,
ight)' = rac{1}{2\sqrt{\mathsf{ne ilde{s}to}}} \cdot (\mathsf{ne ilde{s}to})'$$

$$(\sin(\text{nešto}))' = \cos(\text{nešto}) \cdot (\text{nešto})'$$

Odredite derivaciju funkcije $y = \sqrt{\sin(x^2 - 1)}$.

Rješenje

$$y' = \frac{1}{2\sqrt{\sin(x^2 - 1)}} \cdot \left(\sin(x^2 - 1)\right)' =$$
$$= \frac{1}{2\sqrt{\sin(x^2 - 1)}} \cdot \cos(x^2 - 1)$$

$$(\sqrt{x})' = \frac{1}{2\sqrt{x}}$$

$$\left(\sqrt{\mathsf{ne ilde{s}to}}\,
ight)' = rac{1}{2\sqrt{\mathsf{ne ilde{s}to}}} \cdot (\mathsf{ne ilde{s}to})'$$

$$(\sin(\text{nešto}))' = \cos(\text{nešto}) \cdot (\text{nešto})'$$

Odredite derivaciju funkcije $y = \sqrt{\sin(x^2 - 1)}$.

Rješenje

$$y' = \frac{1}{2\sqrt{\sin(x^2 - 1)}} \cdot \left(\sin(x^2 - 1)\right)' =$$
$$= \frac{1}{2\sqrt{\sin(x^2 - 1)}} \cdot \cos(x^2 - 1) \cdot$$

$$(\sqrt{x})' = \frac{1}{2\sqrt{x}}$$

$$\left(\sqrt{\mathsf{ne ilde{s}to}}\,
ight)' = rac{1}{2\sqrt{\mathsf{ne ilde{s}to}}} \cdot (\mathsf{ne ilde{s}to})'$$

$$(\sin(\text{nešto}))' = \cos(\text{nešto}) \cdot (\text{nešto})'$$

Odredite derivaciju funkcije $y = \sqrt{\sin(x^2 - 1)}$.

$(\sqrt{x})' = \frac{1}{2\sqrt{x}}$

 $(\sin x)' = \cos x$

$$y' = \frac{1}{2\sqrt{\sin(x^2 - 1)}} \cdot \left(\sin(x^2 - 1)\right)' =$$

$$= \frac{1}{2\sqrt{\sin(x^2 - 1)}} \cdot \cos(x^2 - 1) \cdot (x^2 - 1)'$$

$$ig(\sqrt{\mathsf{ne ilde{s}to}}ig)' = rac{1}{2\sqrt{\mathsf{ne ilde{s}to}}}\cdot (\mathsf{ne ilde{s}to})'$$

$$\big(\sin\big(\mathsf{ne\check{s}to}\big)\big)' = \cos\big(\mathsf{ne\check{s}to}\big) \cdot \big(\mathsf{ne\check{s}to}\big)'$$

Odredite derivaciju funkcije $y = \sqrt{\sin(x^2 - 1)}$.

$(\sqrt{x})' = \frac{1}{2\sqrt{x}}$

 $(\sin x)' = \cos x$

$$y' = \frac{1}{2\sqrt{\sin(x^2 - 1)}} \cdot \left(\sin(x^2 - 1)\right)' =$$

$$= \frac{1}{2\sqrt{\sin(x^2 - 1)}} \cdot \cos(x^2 - 1) \cdot (x^2 - 1)' =$$

$$= \frac{1}{2\sqrt{\sin(x^2 - 1)}} \cdot \cos(x^2 - 1) \cdot (x^2 - 1)' =$$

$$\left(\sqrt{\mathsf{ne ilde{s}to}}\,
ight)' = rac{1}{2\sqrt{\mathsf{ne ilde{s}to}}} \cdot (\mathsf{ne ilde{s}to})'$$

$$\big(\sin\big(\mathsf{ne\breve{s}to}\big)\big)' = \cos\big(\mathsf{ne\breve{s}to}\big) \cdot \big(\mathsf{ne\breve{s}to}\big)'$$

Odredite derivaciju funkcije $y = \sqrt{\sin(x^2 - 1)}$.

$(\sqrt{x})' = \frac{1}{2\sqrt{x}}$

$$y' = \frac{1}{2\sqrt{\sin(x^2 - 1)}} \cdot \left(\sin(x^2 - 1)\right)' =$$

$$= \frac{1}{2\sqrt{\sin(x^2 - 1)}} \cdot \cos(x^2 - 1) \cdot (x^2 - 1)' =$$

$$= \frac{1}{2\sqrt{\sin(x^2 - 1)}}$$

$$\left(\sqrt{\mathsf{ne imesto}}\,
ight)' = rac{1}{2\sqrt{\mathsf{ne imesto}}} \cdot (\mathsf{ne imesto})'$$

$$\big(\sin\big(\mathsf{ne\breve{s}to}\big)\big)' = \cos\big(\mathsf{ne\breve{s}to}\big) \cdot \big(\mathsf{ne\breve{s}to}\big)'$$

Odredite derivaciju funkcije $y = \sqrt{\sin(x^2 - 1)}$.

$(\sqrt{x})' = \frac{1}{2\sqrt{x}}$

$(\sin x)' = \cos x$

$$y' = \frac{1}{2\sqrt{\sin(x^2 - 1)}} \cdot \left(\sin(x^2 - 1)\right)' =$$

$$= \frac{1}{2\sqrt{\sin(x^2 - 1)}} \cdot \cos(x^2 - 1) \cdot (x^2 - 1)' =$$

$$= \frac{2x\cos(x^2 - 1)}{2\sqrt{\sin(x^2 - 1)}}$$

$$\left(\sqrt{\mathsf{ne imesto}}\,
ight)' = rac{1}{2\sqrt{\mathsf{ne imesto}}} \cdot (\mathsf{ne imesto})'$$

$$\big(\sin\big(\mathsf{ne\breve{s}to}\big)\big)' = \cos\big(\mathsf{ne\breve{s}to}\big) \cdot \big(\mathsf{ne\breve{s}to}\big)'$$

Odredite derivaciju funkcije $y = \sqrt{\sin(x^2 - 1)}$.

$(\sqrt{x})' = \frac{1}{2\sqrt{x}}$

Rješenje $(\sin x)' = \cos x$

$$y' = \frac{1}{2\sqrt{\sin(x^2 - 1)}} \cdot \left(\sin(x^2 - 1)\right)' =$$

$$= \frac{1}{2\sqrt{\sin(x^2 - 1)}} \cdot \cos(x^2 - 1) \cdot (x^2 - 1)' =$$

$$= \frac{2x\cos(x^2 - 1)}{2\sqrt{\sin(x^2 - 1)}} = \frac{x\cos(x^2 - 1)}{\sqrt{\sin(x^2 - 1)}}$$

$$\left(\sqrt{\mathsf{ne imesto}}\,
ight)' = rac{1}{2\sqrt{\mathsf{ne imesto}}} \cdot (\mathsf{ne imesto})'$$

$$\big(\sin\big(\mathsf{ne\check{s}to}\big)\big)' = \cos\big(\mathsf{ne\check{s}to}\big) \cdot \big(\mathsf{ne\check{s}to}\big)'$$

petnaesti zadatak

Odredite četvrtu derivaciju funkcije $f(x) = \ln(3x + 1)$.

Odredite četvrtu derivaciju funkcije $f(x) = \ln(3x + 1)$.

Rješenje

• Prva derivacija

$$f'(x) =$$

$$\left(\ln\left(\text{nešto}\right)\right)' = \frac{1}{\text{nešto}} \cdot (\text{nešto})'$$
 $\left(\ln x\right)' = \frac{1}{x}$

Odredite četvrtu derivaciju funkcije $f(x) = \ln(3x + 1)$.

Rješenje

• Prva derivacija

 $f'(x) = \frac{1}{3x+1}$

$$\left| \left(\ln \left(\mathsf{ne imesto} \right) \right)' = rac{1}{\mathsf{ne imesto}} \cdot \left(\mathsf{ne imesto} \right)' \, \right| \, \left(\ln x
ight)' = rac{1}{x} \, \right|$$

$$(\ln x)' = \frac{1}{x}$$

Odredite četvrtu derivaciju funkcije $f(x) = \ln(3x + 1)$.

Rješenje

• Prva derivacija

 $f'(x) = \frac{1}{3x+1} \cdot$

$$\left| \left(\ln \left(\mathsf{ne imesto} \right) \right)' = rac{1}{\mathsf{ne imesto}} \cdot \left(\mathsf{ne imesto} \right)' \, \right| \, \left(\ln x
ight)' = rac{1}{x} \,
ight|$$

$$(\ln x)' = \frac{1}{x}$$

Odredite četvrtu derivaciju funkcije $f(x) = \ln(3x + 1)$.

 $f'(x) = \frac{1}{3x+1} \cdot (3x+1)'$

Rješenje

Prva derivacija

$$\left(\ln\left(\mathsf{ne int}\right)\right)' = \frac{1}{\mathsf{ne int}} \cdot (\mathsf{ne int})' \ \left| \ (\ln x)' = \frac{1}{x} \ \right|$$

$$(\ln x)' = \frac{1}{x}$$

Odredite četvrtu derivaciju funkcije $f(x) = \ln(3x + 1)$.

 $f'(x) = \frac{1}{3x+1} \cdot (3x+1)' = \frac{1}{3x+1}$

Rješenje

• Prva derivacija

$$\left(\ln\left(\mathsf{ne int}\right)\right)' = \frac{1}{\mathsf{ne int}} \cdot (\mathsf{ne int})' \ \left| \ (\ln x)' = \frac{1}{x} \ \right|$$

$$(\ln x)' = \frac{1}{x}$$

Odredite četvrtu derivaciju funkcije $f(x) = \ln(3x + 1)$.

 $f'(x) = \frac{1}{3x+1} \cdot (3x+1)' = \frac{1}{3x+1} \cdot 3$

Rješenje
Prva derivacija
$$\left(\ln \left(\text{nešto} \right) \right)' = \frac{1}{\text{nešto}} \cdot \left(\text{nešto} \right)'$$

$$\left(\ln x \right)' = \frac{1}{x}$$

$$(\ln x)' = \frac{1}{x}$$

Odredite četvrtu derivaciju funkcije $f(x) = \ln(3x + 1)$.

Rješenje

• Prva derivacija

$$\left(\ln\left(\mathsf{ne int}\right)\right)' = \frac{1}{\mathsf{ne int}} \cdot (\mathsf{ne int})' \ \left| \ (\ln x)' = \frac{1}{x} \ \right|$$

$$(\ln x)' = \frac{1}{x}$$

$$f'(x) = \frac{1}{3x+1} \cdot (3x+1)' = \frac{1}{3x+1} \cdot 3 = \frac{3}{3x+1}$$

Odredite četvrtu derivaciju funkcije $f(x) = \ln(3x + 1)$.

Rješenje

• Prva derivaciia

$$\left(\ln\left(\mathsf{ne int}\right)\right)' = \frac{1}{\mathsf{ne int}} \cdot (\mathsf{ne int})' \ \left| \ (\ln x)' = \frac{1}{x} \ \right|$$

$$(\ln x)' = \frac{1}{x}$$

$$f'(x) = \frac{1}{3x+1} \cdot (3x+1)' = \frac{1}{3x+1} \cdot 3 = \frac{3}{3x+1}$$
$$f'(x) = 3 \cdot (3x+1)^{-1}$$

Odredite četvrtu derivaciju funkcije $f(x) = \ln(3x + 1)$.

Rješenje

• Prva derivaciia

$$\left(\ln\left(\mathsf{ne imesto}
ight)\right)' = rac{1}{\mathsf{ne imesto}}\cdot\left(\mathsf{ne imesto}
ight)' \ \left|\ (\ln x)' = rac{1}{x} \
ight|$$

$$(\ln x)' = \frac{1}{x}$$

$$f'(x) = \frac{1}{3x+1} \cdot (3x+1)' = \frac{1}{3x+1} \cdot 3 = \frac{3}{3x+1}$$
$$f'(x) = 3 \cdot (3x+1)^{-1}$$

$$f''(x) =$$

Odredite četvrtu derivaciju funkcije $f(x) = \ln(3x + 1)$.

Rješenje

• Prva derivaciia

$$\left(\ln\left(\text{nešto}\right)\right)' = \frac{1}{\text{nešto}}\cdot\left(\text{nešto}\right)'$$
 $\left(\ln x\right)' = \frac{1}{x}$

$$(\ln x)' = \frac{1}{x}$$

$$f'(x) = \frac{1}{3x+1} \cdot (3x+1)' = \frac{1}{3x+1} \cdot 3 = \frac{3}{3x+1}$$
$$f'(x) = 3 \cdot (3x+1)^{-1}$$

$$f''(x) = 3$$

$$\left((\mathsf{ne ext{sto}})^n\right)' = n(\mathsf{ne ext{sto}})^{n-1} \cdot (\mathsf{ne ext{sto}})' \quad \left| \quad (x^n)' = nx^{n-1} \right|$$

Odredite četvrtu derivaciju funkcije $f(x) = \ln(3x + 1)$.

Rješenje

• Prva derivaciia

$$\left(\ln\left(\text{nešto}\right)\right)' = \frac{1}{\text{nešto}} \cdot (\text{nešto})'$$
 $\left(\ln x\right)' = \frac{1}{x}$

$$f'(x) = \frac{1}{3x+1} \cdot (3x+1)' = \frac{1}{3x+1} \cdot 3 = \frac{3}{3x+1}$$
$$f'(x) = 3 \cdot (3x+1)^{-1}$$

$$f''(x) = 3 \cdot (-1) \cdot (3x+1)^{-2}$$

$$\left((\mathsf{ne imesto})^n\right)' = n(\mathsf{ne imesto})^{n-1} \cdot (\mathsf{ne imesto})' \quad \left| \quad (x^n)' = nx^{n-1} \right|$$

Odredite četvrtu derivaciju funkcije $f(x) = \ln(3x + 1)$.

Rješenje

• Prva derivaciia

$$\left(\ln\left(\text{nešto}\right)\right)' = \frac{1}{\text{nešto}}\cdot\left(\text{nešto}\right)'$$
 $\left(\ln x\right)' = \frac{1}{x}$

$$f'(x) = \frac{1}{3x+1} \cdot (3x+1)' = \frac{1}{3x+1} \cdot 3 = \frac{3}{3x+1}$$
$$f'(x) = 3 \cdot (3x+1)^{-1}$$

$$f''(x) = 3 \cdot (-1) \cdot (3x+1)^{-2}$$

$$((\text{nešto})^n)' = n(\text{nešto})^{n-1} \cdot (\text{nešto})' \mid (x^n)' = nx^{n-1}$$

Odredite četvrtu derivaciju funkcije $f(x) = \ln(3x + 1)$.

Rješenje

$$f'(x) = \frac{1}{3x+1} \cdot (3x+1)' = \frac{1}{3x+1} \cdot 3 = \frac{3}{3x+1}$$
$$f'(x) = 3 \cdot (3x+1)^{-1}$$

$$f''(x) = 3 \cdot (-1) \cdot (3x+1)^{-2} \cdot (3x+1)'$$

$$\left((\mathsf{ne imesto})^n\right)' = n(\mathsf{ne imesto})^{n-1} \cdot (\mathsf{ne imesto})' \mid (x^n)' = nx^{n-1}$$

Odredite četvrtu derivaciju funkcije $f(x) = \ln(3x + 1)$.

Rješenje

$$f'(x) = \frac{1}{3x+1} \cdot (3x+1)' = \frac{1}{3x+1} \cdot 3 = \frac{3}{3x+1}$$
$$f'(x) = 3 \cdot (3x+1)^{-1}$$

$$f''(x) = 3 \cdot (-1) \cdot (3x+1)^{-2} \cdot (3x+1)' = -3 \cdot (3x+1)^{-2}$$

$$\left((\mathsf{ne ext{sto}})^n\right)' = n(\mathsf{ne ext{sto}})^{n-1} \cdot (\mathsf{ne ext{sto}})' \quad \left| \quad (x^n)' = nx^{n-1} \right|$$

Odredite četvrtu derivaciju funkcije $f(x) = \ln(3x + 1)$.

Rješenje

$$f'(x) = \frac{1}{3x+1} \cdot (3x+1)' = \frac{1}{3x+1} \cdot 3 = \frac{3}{3x+1}$$

$$f'(x) = 3 \cdot (3x+1)^{-1}$$

$$f''(x) = 3 \cdot (-1) \cdot (3x+1)^{-2} \cdot (3x+1)' = -3 \cdot (3x+1)^{-2} \cdot 3$$

$$((\text{nešto})^n)' = n(\text{nešto})^{n-1} \cdot (\text{nešto})' \mid (x^n)' = nx^{n-1}$$

Odredite četvrtu derivaciju funkcije $f(x) = \ln(3x + 1)$.

Rješenje

$$f'(x) = 3 \cdot (3x+1)^{-1}$$

$$f''(x) = 3 \cdot (-1) \cdot (3x+1)^{-2} \cdot (3x+1)' = -3 \cdot (3x+1)^{-2} \cdot 3$$
$$f''(x) = -9 \cdot (3x+1)^{-2}$$

$$f''(x) = -9 \cdot (3x+1)^{-3}$$

$$\left((\mathsf{ne imesto})^n\right)' = n(\mathsf{ne imesto})^{n-1} \cdot (\mathsf{ne imesto})' \quad \boxed{(x^n)' = nx^{n-1}}$$

 $f''(x) = -9 \cdot (3x+1)^{-2}$

• Treća derivacija

$$f'''(x) =$$

$$f''(x) = -9 \cdot (3x+1)^{-2}$$

• Treća derivacija

$$f'''(x) = -9 \cdot$$

$$((\text{nešto})^n)' = n(\text{nešto})^{n-1} \cdot (\text{nešto})'$$
 $(x^n)' = nx^{n-1}$

$$f''(x) = -9 \cdot (3x+1)^{-2}$$

$$f'''(x) = -9 \cdot (-2) \cdot (3x+1)^{-3}$$

$$\left((\mathsf{ne imesto})^n\right)' = n(\mathsf{ne imesto})^{n-1} \cdot (\mathsf{ne imesto})'$$
 $x^n = n x^{n-1}$

$$f''(x) = -9 \cdot (3x+1)^{-2}$$

$$f'''(x) = -9 \cdot (-2) \cdot (3x+1)^{-3}$$

$$\left((\text{nešto})^n \right)' = n (\text{nešto})^{n-1} \cdot (\text{nešto})'$$
 $\left[(x^n)' = nx^{n-1} \right]$

$$f''(x) = -9 \cdot (3x+1)^{-2}$$

$$f'''(x) = -9 \cdot (-2) \cdot (3x+1)^{-3} \cdot (3x+1)^{-3}$$

$$((\text{nešto})^n)' = n(\text{nešto})^{n-1} \cdot (\text{nešto})'$$
 $(x^n)' = nx^{n-1}$

$$f''(x) = -9 \cdot (3x+1)^{-2}$$

$$f'''(x) = -9 \cdot (-2) \cdot (3x+1)^{-3} \cdot (3x+1)' = 18 \cdot (3x+1)^{-3}$$

$$((\text{nešto})^n)' = n(\text{nešto})^{n-1} \cdot (\text{nešto})' \mid (x^n)' = nx^{n-1}$$

$$f''(x) = -9 \cdot (3x+1)^{-2}$$

$$f'''(x) = -9 \cdot (-2) \cdot (3x+1)^{-3} \cdot (3x+1)' = 18 \cdot (3x+1)^{-3} \cdot 3$$

$$\left((\text{nešto})^n\right)' = n(\text{nešto})^{n-1} \cdot (\text{nešto})'$$
 $(x^n)' = nx^{n-1}$

$$f''(x) = -9 \cdot (3x+1)^{-2}$$

$$f'''(x) = -9 \cdot (-2) \cdot (3x+1)^{-3} \cdot (3x+1)' = 18 \cdot (3x+1)^{-3} \cdot 3$$
$$f'''(x) = 54 \cdot (3x+1)^{-3}$$

$$((\text{nešto})^n)' = n(\text{nešto})^{n-1} \cdot (\text{nešto})'$$
 $(x^n)' = nx^{n-1}$

$$f''(x) = -9 \cdot (3x+1)^{-2}$$

$$f'''(x) = -9 \cdot (-2) \cdot (3x+1)^{-3} \cdot (3x+1)' = 18 \cdot (3x+1)^{-3} \cdot 3$$
$$f'''(x) = 54 \cdot (3x+1)^{-3}$$

Četvrta derivacija

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

$$f''(x) = -9 \cdot (3x+1)^{-2}$$

$$f'''(x) = -9 \cdot (-2) \cdot (3x+1)^{-3} \cdot (3x+1)' = 18 \cdot (3x+1)^{-3} \cdot 3$$
$$f'''(x) = 54 \cdot (3x+1)^{-3}$$

Četvrta derivacija

$$f^{(4)}(x) = 54$$

$$((\text{nešto})^n)' = n(\text{nešto})^{n-1} \cdot (\text{nešto})'$$
 $(x^n)' = nx^{n-1}$

$$f''(x) = -9 \cdot (3x+1)^{-2}$$

$$f'''(x) = -9 \cdot (-2) \cdot (3x+1)^{-3} \cdot (3x+1)' = 18 \cdot (3x+1)^{-3} \cdot 3$$
$$f'''(x) = 54 \cdot (3x+1)^{-3}$$

• Četvrta derivacija

$$f^{(4)}(x) = 54 \cdot (-3) \cdot (3x+1)^{-4}$$

$$((\text{nešto})^n)' = n(\text{nešto})^{n-1} \cdot (\text{nešto})' \mid (x^n)' = nx^{n-1}$$

$$f''(x) = -9 \cdot (3x+1)^{-2}$$

$$f'''(x) = -9 \cdot (-2) \cdot (3x+1)^{-3} \cdot (3x+1)' = 18 \cdot (3x+1)^{-3} \cdot 3$$
$$f'''(x) = 54 \cdot (3x+1)^{-3}$$

Četvrta derivacija

$$f^{(4)}(x) = 54 \cdot (-3) \cdot (3x+1)^{-4}$$

$$((\text{nešto})^n)' = n(\text{nešto})^{n-1} \cdot (\text{nešto})' \mid (x^n)' = nx^{n-1}$$

$$f''(x) = -9 \cdot (3x+1)^{-2}$$

$$f'''(x) = -9 \cdot (-2) \cdot (3x+1)^{-3} \cdot (3x+1)' = 18 \cdot (3x+1)^{-3} \cdot 3$$
$$f'''(x) = 54 \cdot (3x+1)^{-3}$$

• Četvrta derivacija

$$f^{(4)}(x) = 54 \cdot (-3) \cdot (3x+1)^{-4} \cdot (3x+1)'$$

$$\left((\text{nešto})^n \right)' = n(\text{nešto})^{n-1} \cdot (\text{nešto})' \quad \left| \quad (x^n)' = nx^{n-1} \right|$$

$$f''(x) = -9 \cdot (3x+1)^{-2}$$

$$f'''(x) = -9 \cdot (-2) \cdot (3x+1)^{-3} \cdot (3x+1)' = 18 \cdot (3x+1)^{-3} \cdot 3$$
$$f'''(x) = 54 \cdot (3x+1)^{-3}$$

• Četvrta derivacija

$$f^{(4)}(x) = 54 \cdot (-3) \cdot (3x+1)^{-4} \cdot (3x+1)' = -162 \cdot (3x+1)^{-4}$$

$$\left((\text{nešto})^n \right)' = n(\text{nešto})^{n-1} \cdot (\text{nešto})' \quad \left| \quad (x^n)' = nx^{n-1} \right|$$

$$f''(x) = -9 \cdot (3x+1)^{-2}$$

$$f'''(x) = -9 \cdot (-2) \cdot (3x+1)^{-3} \cdot (3x+1)' = 18 \cdot (3x+1)^{-3} \cdot 3$$
$$f'''(x) = 54 \cdot (3x+1)^{-3}$$

Četvrta derivacija

$$f^{(4)}(x) = 54 \cdot (-3) \cdot (3x+1)^{-4} \cdot (3x+1)' = -162 \cdot (3x+1)^{-4} \cdot 3$$

 $\left((\text{nešto})^n \right)' = n(\text{nešto})^{n-1} \cdot (\text{nešto})' \mid (x^n)' = nx^{n-1}$

$$f''(x) = -9 \cdot (3x+1)^{-2}$$

$$f'''(x) = -9 \cdot (-2) \cdot (3x+1)^{-3} \cdot (3x+1)' = 18 \cdot (3x+1)^{-3} \cdot 3$$
$$f'''(x) = 54 \cdot (3x+1)^{-3}$$

Četvrta derivacija

$$f^{(4)}(x) = 54 \cdot (-3) \cdot (3x+1)^{-4} \cdot (3x+1)' = -162 \cdot (3x+1)^{-4} \cdot 3$$
$$f^{(4)}(x) = -486 \cdot (3x+1)^{-4}$$

$$((\text{nešto})^n)' = n(\text{nešto})^{n-1} \cdot (\text{nešto})'$$
 $(x^n)' = nx^{n-1}$

$$f''(x) = -9 \cdot (3x+1)^{-2}$$

$$f'''(x) = -9 \cdot (-2) \cdot (3x+1)^{-3} \cdot (3x+1)' = 18 \cdot (3x+1)^{-3} \cdot 3$$
$$f'''(x) = 54 \cdot (3x+1)^{-3}$$

• Četvrta derivacija

$$f^{(4)}(x) = 54 \cdot (-3) \cdot (3x+1)^{-4} \cdot (3x+1)' = -162 \cdot (3x+1)^{-4} \cdot 3$$
$$f^{(4)}(x) = -486 \cdot (3x+1)^{-4}$$

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

$$\big((\mathsf{ne imesto})^n\big)' = \mathit{n}(\mathsf{ne imesto})^{n-1} \cdot (\mathsf{ne imesto})' \quad \boxed{(x^n)' = \mathit{n}x^{n-1}}$$



šesnaesti zadatak

Zadatak 16

Odredite jednadžbu tangente na graf funkcije $y = \ln (5 - 4x)$ u točki s apscisom 1. Odredite duljinu odsječka dobivene tangente između koordinatnih osi.

Zadatak 16

Odredite jednadžbu tangente na graf funkcije $y = \ln(5 - 4x)$ u točki s apscisom 1. Odredite duljinu odsječka dobivene tangente između koordinatnih osi.

Rješenje

ullet Jednadžba tangente na graf funkcije y=f(x) u točki $T_0(x_0,y_0)$

$$t \dots y - y_0 = k_t \cdot (x - x_0)$$

Zadatak 16

Odredite jednadžbu tangente na graf funkcije $y = \ln(5 - 4x)$ u točki s apscisom 1. Odredite duljinu odsječka dobivene tangente između koordinatnih osi.

Rješenje

• Jednadžba tangente na graf funkcije y = f(x) u točki $T_0(x_0, y_0)$

$$t \dots y - y_0 = k_t \cdot (x - x_0)$$

• Pritom je $y_0 = f(x_0)$ i $k_t = f'(x_0)$.

$$y = \ln(5 - 4x)$$

$$y=\ln\left(5-4x\right)$$

$$y_0 = \ln \left(5 - 4 \cdot 1 \right)$$

$$y = \ln(5 - 4x)$$

$$y_0 = \ln(5 - 4 \cdot 1) = \ln 1 = 0$$

$$y=\ln\left(5-4x\right)$$

$$y_0 = \ln(5 - 4 \cdot 1) = \ln 1 = 0$$

Točka: $T_0(1,0)$

 $y = \ln(5 - 4x)$

$$y_0 = \ln(5 - 4 \cdot 1) = \ln 1 = 0$$

Točka: $T_0(1,0)$

Derivacija funkcije

$$\mathbf{v}'$$

 $y = \ln(5 - 4x)$

$$y_0 = \ln(5 - 4 \cdot 1) = \ln 1 = 0$$

Točka: $T_0(1,0)$

$$y' = \frac{1}{5 - 4x}$$

$$\left(\ln\left(\text{nešto}\right)\right)' = \frac{1}{\text{nešto}} \cdot \left(\text{nešto}\right)'$$
 $\left(\ln x\right)' = \frac{1}{x}$

 $y = \ln(5 - 4x)$

 $y_0 = \ln(5 - 4 \cdot 1) = \ln 1 = 0$

Točka: $T_0(1,0)$

_

$$y'=\frac{1}{5-4x}\cdot(5-4x)'$$

 $\left(\ln\left(\text{nešto}\right)\right)' = \frac{1}{\text{nešto}} \cdot \left(\text{nešto}\right)' \qquad \left(\ln x\right)' = \frac{1}{x}$

 $y = \ln(5 - 4x)$

 $y_0 = \ln(5 - 4 \cdot 1) = \ln 1 = 0$

Točka: $T_0(1,0)$

Derivacija funkcije

$$y' = \frac{1}{5 - 4x} \cdot (5 - 4x)' = \frac{1}{5 - 4x}$$

$$\left(\ln\left(\text{nešto}\right)\right)' = \frac{1}{\text{nešto}} \cdot \left(\text{nešto}\right)' \qquad \left(\ln x\right)' = \frac{1}{x}$$

 $y = \ln(5 - 4x)$

 $y_0 = \ln(5 - 4 \cdot 1) = \ln 1 = 0$

Točka: $T_0(1,0)$

$$y' = \frac{1}{5 - 4x} \cdot (5 - 4x)' = \frac{1}{5 - 4x} \cdot (-4)$$

$$\left(\ln\left(\text{nešto}\right)\right)' = \frac{1}{\text{nešto}} \cdot \left(\text{nešto}\right)' \quad \left(\ln x\right)' = \frac{1}{x}$$

 $y = \ln(5 - 4x)$

 $y_0 = \ln(5 - 4 \cdot 1) = \ln 1 = 0$

Točka: $T_0(1,0)$

Derivacija funkcije

$$y' = \frac{1}{5-4x} \cdot (5-4x)' = \frac{1}{5-4x} \cdot (-4) = \frac{-4}{5-4x}$$

$$\left(\ln\left(\text{nešto}\right)\right)' = \frac{1}{\text{nešto}} \cdot \left(\text{nešto}\right)'$$

$$\left(\ln x\right)' = \frac{1}{x}$$

 $y = \ln(5 - 4x)$

Točka: $T_0(1,0)$

• Derivacija funkcije
$$y' = \frac{1}{5 - 4x} \cdot (5 - 4x)' = \frac{1}{5 - 4x} \cdot (-4) = \frac{-4}{5 - 4x}$$

Koeficijent smjera tangente

$$k_t = y'(1)$$

 $\left(\ln\left(\text{nešto}\right)\right)' = \frac{1}{\text{nešto}} \cdot \left(\text{nešto}\right)' \left| \left(\ln x\right)' = \frac{1}{x} \right|$

 $y_0 = \ln(5 - 4 \cdot 1) = \ln 1 = 0$

 $y = \ln(5 - 4x)$

Točka: $T_0(1,0)$

• Derivacija funkcije
$$y' = \frac{1}{5 - 4x} \cdot (5 - 4x)' = \frac{1}{5 - 4x} \cdot (-4) = \frac{-4}{5 - 4x}$$

Koeficijent smjera tangente

$$k_t = y'(1) = \frac{-4}{5 - 4 \cdot 1}$$

 $v_0 = \ln (5 - 4 \cdot 1) = \ln 1 = 0$

$$(\ln (\text{nešto}))' = \frac{1}{\text{nešto}} \cdot (\text{nešto})'$$

$$(\ln x)' = \frac{1}{x}$$

 $y = \ln(5 - 4x)$

Točka: $T_0(1,0)$

• Derivacija funkcije
$$y' = \frac{1}{5 - 4x} \cdot (5 - 4x)' = \frac{1}{5 - 4x} \cdot (-4) = \frac{-4}{5 - 4x}$$

Koeficijent smjera tangente

 $\left(\ln\left(\text{nešto}\right)\right)' = \frac{1}{\text{nešto}} \cdot \left(\text{nešto}\right)' \left| \left(\ln x\right)' = \frac{1}{x} \right|$

tangente
$$k_t = y'(1) = \frac{-4}{5 - 4 \cdot 1} = -4$$

 $v_0 = \ln (5 - 4 \cdot 1) = \ln 1 = 0$

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$$x_0 = 1 \qquad \qquad x_0 = 0$$

$$y-y_0=k_t\cdot(x-x_0)$$

$$x_0 = 1 \qquad \qquad x_0 = 0$$

$$y - y_0 = k_t \cdot (x - x_0)$$

 $y - 0 = -4 \cdot (x - 1)$

$$x_0 = 1 \qquad y_0 = 0 \qquad k_t = -4$$

$$y - y_0 = k_t \cdot (x - x_0)$$

 $y - 0 = -4 \cdot (x - 1)$
 $y = -4x + 4$

$$\boxed{x_0 = 1} \qquad \boxed{y_0 = 0}$$

$$y - y_0 = k_t \cdot (x - x_0)$$

 $y - 0 = -4 \cdot (x - 1)$
 $y = -4x + 4$

