Eredmények

1.

$\sqrt{19 + 8\sqrt{3}} - \sqrt{3}$ // FullSimplify

4

$\sqrt[3]{7^{\text{Log}\left[\sqrt{7},2\right] - \text{Log}[49,1/4]}}$ // FullSimplify

2

2.

$\left(\dfrac{x^2 - y^2}{2}\right) \left(\dfrac{1}{(x+y)^2} - \dfrac{1}{(x-y)^2}\right) \Big/ \left(\dfrac{1}{x+y} - \dfrac{1}{x-y}\right)$ // FullSimplify

x

3.

$\sqrt[3]{\dfrac{\sqrt{x^9 \sqrt{x}}}{x^2 \sqrt[8]{x}}} \, \sqrt[8]{x^9}$ // PowerExpand

x^2

5.

$\dfrac{2 x^2 (x-2)^2 (x+1)^2 - (2 x^2 - 4 x)(x^2 - 1)^2}{(x-2)^4 (x+1)^2}$ // FullSimplify

$-\dfrac{2 x}{(-2 + x)^3}$

1.

$\sqrt{27 + 10\sqrt{2}} - \sqrt{2}$ // FullSimplify

5

$\sqrt[5]{5^{\text{Log}\left[\sqrt{5},4\right] - \text{Log}[125,1/8]}}$ // FullSimplify

2

2.

$$\left(\frac{a^2 - b^2}{2}\right) \left(\frac{1}{(a-b)^2} - \frac{1}{(a+b)^2}\right) \Big/ \left(\frac{1}{a-b} - \frac{1}{a+b}\right) \text{ // FullSimplify}$$

a

3.

$$\sqrt[5]{\frac{\sqrt{x^{12} \sqrt{x}}}{x^4 \sqrt[6]{x}}} \; \frac{1}{\sqrt[6]{x}} \text{ // PowerExpand}$$

$x^{1/4}$

5.

$$\frac{(x+2)^4 (x-1)^2}{(2 x^2 + 4 x) (x^2 - 1)^2 - 2 x^2 (x+2)^2 (x-1)^2} \text{ // FullSimplify}$$

$\dfrac{(2+x)^3}{2 x}$

2015-2016/1. Bevezető matematika, 1. zárthelyi, kedd $\quad$ A

1.

$$\left(\sqrt{5}\right)^{\text{Log}[25,16]} \text{ // FullSimplify}$$

2

$$\sqrt{100^{2 - \text{Log}[10,5]}} \text{ // FullSimplify}$$

20

$$\left(\frac{1}{\sqrt{27}}\right)^{\text{Log}[3,4]} \text{ // FullSimplify}$$

$\dfrac{1}{8}$

2.

$$\left(\frac{x^2 - 3 x + 1}{x^3 - 1} + \frac{1}{x-1} - \frac{x-1}{3 x + (x-1)^2}\right) \Big/ \frac{x^2 + 1}{x-1} \text{ // FullSimplify}$$

$\dfrac{1}{1 + x + x^2}$

3.

```
Sqrt[x^4 Sqrt[3, x]] Sqrt[3, x^-6 Sqrt[x^5]] / Sqrt[4, x] // PowerExpand
```

$$\sqrt{x^4 \sqrt[3]{x}}\ \frac{\sqrt[3]{x^{-6}\sqrt{x^5}}}{\sqrt[4]{x}}\ \text{// PowerExpand}$$

$x^{3/4}$

4.

```
Reduce[5 - Abs[2 x + 1] > 0, x, Reals] (*értelmezési tartomány*)
Reduce[5 - Abs[2 x + 1] == 1, x, Reals] (*zérushely*)
```

$-3 < x < 2$

$x == -\frac{5}{2}\ ||\ x == \frac{3}{2}$

5.

```
a = 0.8; b = 800;
Reduce[a (a x + b) + b == 6000, x]
```

$x == 7125.$

2015-2016/1. Bevezető matematika, 1. zárthelyi, kedd   B

1.

```
(7)^Log[Sqrt[7], 3] // FullSimplify
```

$(7)^{\text{Log}\left[\sqrt{7},3\right]}\ \text{// FullSimplify}$

9

```
Sqrt[36^(1 - Log[6, 10])] // FullSimplify
```

$\sqrt{36^{1-\text{Log}[6,10]}}\ \text{// FullSimplify}$

$\frac{3}{5}$

```
(1 / Sqrt[125])^Log[5, 4] // FullSimplify
```

$\left(\frac{1}{\sqrt{125}}\right)^{\text{Log}[5,4]}\ \text{// FullSimplify}$

$\frac{1}{8}$

2.

$$\frac{x^2+1}{x+1}\Big/\left(\frac{x^2+3x+1}{x^3+1}+\frac{1}{x+1}+\frac{x+1}{3x-(x+1)^2}\right)\ \text{// Apart}$$

$1 - x + x^2$

3.

$$\sqrt{x^2 \sqrt[4]{x}} \ \frac{\sqrt[6]{x^{-3} \sqrt{x^3}}}{\sqrt{x}} \ \text{// PowerExpand}$$

$x^{3/8}$

4.

```
Reduce[Abs[4 x - 3] - 10 > 0, x, Reals](*értelmezési tartomány*)
Reduce[Abs[4 x - 3] - 10 == 1, x, Reals](*zérushely*)
```

$x < -\dfrac{7}{4} \ || \ x > \dfrac{13}{4}$

$x == -2 \ || \ x == \dfrac{7}{2}$

5.

```
a = 0.8; b = 1000;
Reduce[a (a x + b) + b == 7000, x]
```

$x == 8125.$

2015-2016/1. Bevezető matematika, 1. zárthelyi, szerda   A

1.

$$\sqrt[3]{4^{6-\text{Log}\left[\sqrt{2},8\right]}} \ \text{// FullSimplify}$$

1

$$25^{1+\text{Log}[5,2]} \ \text{// FullSimplify}$$

100

2.

$$\left(\frac{2x}{x+1} + \frac{2}{x-1} + \frac{4x}{x^2-1}\right) \left(\frac{2x}{x+1} + \frac{2}{x-1} - \frac{4x}{x^2-1}\right) \ \text{// FullSimplify}$$

4

3.

$$\sqrt{x^6 \sqrt[5]{x \sqrt{x^8}}} \ \frac{\sqrt{x}}{\sqrt[3]{x^5}} \ \text{// PowerExpand}$$

$x^{7/3}$

4.

$$\frac{4\,(x+2)\,(x-1)^4 - (x-1)^2\,(x+2)^3}{x\,(x+2)^4\,(x-1)^2} \text{ // FullSimplify}$$

$$\frac{3\,(-4+x)}{(2+x)^3}$$

5.

```
x = 10; y = 15; z = 20;
```

$$\frac{1}{\frac{1}{x}+\frac{1}{y}+\frac{1}{z}} \text{ (*együttes munkával az összidő*)}$$

```
N[%]
```

$$\frac{60}{13}$$

4.61538

2015-2016/1. Bevezető matematika, 1. zárthelyi, szerda   B

1.

$$\sqrt[3]{9^{6-\text{Log}\left[\sqrt{3}\,,27\right]}} \text{ // FullSimplify}$$

1

$$36^{1-\text{Log}[6,2]} \text{ // FullSimplify}$$

9

2.

$$\left(\frac{a}{a-1}-\frac{1}{a+1}-\frac{2\,a}{a^2-1}\right)\left(\frac{a}{a-1}-\frac{1}{a+1}+\frac{2\,a}{a^2-1}\right) \text{ // FullSimplify}$$

1

3.

$$\sqrt{x^4\,\sqrt[3]{x\,\sqrt{x^9}}}\ \frac{\sqrt[3]{x^4}}{\sqrt{x^5}} \text{ // PowerExpand}$$

$x^{7/4}$

4.

$$\frac{x\,(x-2)^4\,(x+1)^2}{4\,(x-2)\,(x+1)^4 - (x+1)^2\,(x-2)^3} \text{ // FullSimplify}$$

$$\frac{(-2+x)^3}{3\,(4+x)}$$

5.

```
x = 4; y = 6; z = 10;
```

$$\frac{1}{\frac{1}{x} + \frac{1}{y} + \frac{1}{z}} \text{ (*együttes munkával az összidő*)}$$

```
N[%]
```

$$\frac{60}{31}$$

1.93548

2015-2016/1. Bevezető matematika, 1. zárthelyi, csütörtök A

1.

$$16^{\text{Log}[8,27]+\text{Log}[2,1/3]} \text{ // FullSimplify}$$

1

$$\left(\sqrt{2}\,\right)^{\text{Log}[8,64]} \text{ // FullSimplify}$$

2

$$\frac{5^{2015} - 5^{2013}}{5^{2013} - 5^{2014}} \text{ // FullSimplify}$$

-6

2.

$$\left(\frac{a^2 - 3\,a\,b}{a+b} + b\right)\Big/\left(\frac{a}{a+b} - \frac{b}{b-a} - \frac{2\,a\,b}{a^2-b^2}\right) \text{ // FullSimplify}$$

$a - b$

3.

$$\sqrt[3]{\frac{x^{-2}}{\sqrt{x}\,\sqrt[4]{x^3}}}\ \sqrt{x\,\sqrt{x}} \text{ // PowerExpand}$$

$$\frac{1}{x^{1/3}}$$

4.

```
f[x_] := Log[1 / 3, x]
g[x_] := √(x² + 17)
f[g[8]]
g[f[9]]
```

-2

$\sqrt{21}$

5.

```
Reduce[1 + 4 x - 2 x² > 0, x, Reals] (*értelmezési tartomány*)
Reduce[1 + 4 x - 2 x² == 1, x, Reals] (*zérushely*)
```

$$\frac{1}{2}\left(2 - \sqrt{6}\right) < x < \frac{1}{2}\left(2 + \sqrt{6}\right)$$

$x == 0 \mid\mid x == 2$

2015-2016/1. Bevezető matematika, 1. zárthelyi, csütörtök   B

1.

```
81^(Log[27,8]+Log[3,1/2]) // FullSimplify
```

1

```
(√2)^Log[4,16] // FullSimplify
```

2

$$\frac{7^{2016} - 7^{2014}}{7^{2014} - 7^{2015}}$$ ``// FullSimplify``

-8

2.

$$\left(\frac{x}{x - y} - \frac{y}{x + y} + \frac{2 x y}{x² - y²}\right) \Big/ \left(\frac{x² + 3 x y}{x - y} - y\right)$$ ``// FullSimplify``

$$\frac{1}{x + y}$$

3.

$$\sqrt[5]{\frac{x^{-3}}{\sqrt[4]{x} \ \sqrt[3]{x^4}}} \ \sqrt{x \sqrt{x^3}}$$ ``// PowerExpand``

$x^{1/3}$

4.

```
f[x_] := Log[1 / 4, x]
```

$$g[x\_] := \frac{1}{\sqrt[3]{x^2 - 1}}$$

```
f[g[3]]
```

```
g[f[16]]
```

$$\frac{1}{2}$$

$$\frac{1}{3^{1/3}}$$

5.

```
Reduce[1 - 6 x - 2 x² > 0, x, Reals] (*értelmezési tartomány*)
```

```
Reduce[1 - 6 x - 2 x² == 1, x, Reals] (*zérushely*)
```

$$\frac{1}{2}\left(-3 - \sqrt{15}\right) < x < \frac{1}{2}\left(-3 + \sqrt{15}\right)$$

$$x == \frac{1}{2}\left(-3 - \sqrt{13}\right) \ || \ x == \frac{1}{2}\left(-3 + \sqrt{13}\right)$$

2015-2016/1. Bevezető matematika, 1. zárthelyi, péntek   A

1.

$$25^{\text{Log}\left[\sqrt{5}, 2\right]} \text{ // FullSimplify}$$

```
16
```

$$\sqrt{81^{1-\text{Log}\left[2, \sqrt{2}\right]}} \text{ // FullSimplify}$$

```
3
```

$$\left(\frac{1}{\sqrt{2}}\right)^{\text{Log}[4, 81]} \text{ // FullSimplify}$$

$$\frac{1}{3}$$

2.

$$\left(\frac{3 y^2}{x^4 + x y^3} - \frac{1}{x^2 + x y} - \frac{y}{x^3 - x^2 y + x y^2}\right)\left(y - \frac{x^2}{x - y}\right) \text{ // FullSimplify}$$

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

3.

$$\frac{\sqrt{x^{-1}\sqrt[3]{x}}\ \sqrt[5]{x^{12}\sqrt{x}}}{\sqrt{x^3}}\ \text{// PowerExpand}$$

$x^{2/3}$

5.

$$\frac{(x-2)^3\,(x+1)^2-(x+1)^3\,(x-2)^2}{(x^2-1)^4\,(x-2)}\ \text{// FullSimplify}$$

$-\dfrac{3\,(-2+x)}{(-1+x)^4\,(1+x)^2}$

2015-2016/1. Bevezető matematika, 1. zárthelyi, péntek B

1.

$49^{\text{Log}\left[\sqrt{7}\,,2\right]}\ \text{// FullSimplify}$

16

$\sqrt{16^{1-\text{Log}\left[5,\sqrt{5}\,\right]}}\ \text{// FullSimplify}$

2

$\left(\dfrac{1}{\sqrt{3}}\right)^{\text{Log}[9,16]}\ \text{// FullSimplify}$

$\dfrac{1}{2}$

2.

$\left(a-\dfrac{b^2}{b-a}\right)\left(\dfrac{3\,a^2}{a^3\,b+b^4}-\dfrac{1}{a\,b+b^2}-\dfrac{a}{a^2\,b-a\,b^2+b^3}\right)\ \text{// FullSimplify}$

$\dfrac{1}{b}$

3.

$$\frac{\sqrt{x^{-2}\sqrt{x^3}}\ \sqrt[4]{x^{15}\sqrt{x}}}{\sqrt{x^7}}\ \text{// PowerExpand}$$

$x^{1/8}$

5.

$$\frac{\left(x^2-1\right)^4 \left(x+3\right)}{\left(x+3\right)^3 \left(x+1\right)^2 - \left(x+1\right)^3 \left(x+3\right)^2} \text{ // FullSimplify}$$

$$\frac{(-1+x)^4 \, (1+x)^2}{2 \, (3+x)}$$