

# Hétfő

## A

1.

$$\left\{ 9^{\text{Log}[\sqrt{3}, 2]}, \sqrt{4^{2-\text{Log}[2, 8]}}, \left( \frac{1}{\sqrt{10}} \right)^{\text{Log}[10, 16]} \right\} // \text{FullSimplify}$$

$$9^{\text{Log}[\sqrt{3}, 2]} * \sqrt{4^{2-\text{Log}[2, 8]}} * \left( \frac{1}{\sqrt{10}} \right)^{\text{Log}[10, 16]} // \text{FullSimplify}$$

$$\left\{ 16, \frac{1}{2}, \frac{1}{4} \right\}$$

2

2.

$$\frac{(\sqrt{3})^{2n+4} 3^{-n} 9^{n/2+1}}{3^n (\sqrt{3})^n (\sqrt{3})^{n+8} 2^n 4^{-n} 16^{n/4}} // \text{FullSimplify}$$

$3^{-n}$

3.

$$\text{FullSimplify} \left[ \left( \frac{b^2}{a^3 - a b^2} + \frac{1}{a + b} \right) / \left( \frac{a - b}{a^2 + a b} - \frac{a}{b^2 + a b} \right) \right]$$

$$-\frac{b}{a - b}$$

5.

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

$$\frac{(-8+x)(1+x)^2}{(-2+x)^3}$$

## B

1.

$$\{25^{\text{Log}[1/5, \sqrt{5}]}, \sqrt{9^{2-\text{Log}[3, 27]}}, (\sqrt{7})^{\text{Log}[49, 16]}\} // \text{FullSimplify}$$

$$25^{\text{Log}[1/5, \sqrt{5}]} * \sqrt{9^{2-\text{Log}[3, 27]}} * (\sqrt{7})^{\text{Log}[49, 16]} // \text{FullSimplify}$$

$$\left\{\frac{1}{5}, \frac{1}{3}, 2\right\}$$

$$\frac{2}{15}$$

2.

$$\frac{5^n (\sqrt{5})^n (\sqrt{5})^{n+8} 3^n 9^{-n} 81^{n/4}}{(\sqrt{5})^{2n+4} 5^{-n} 25^{n/2+1}} // \text{FullSimplify}$$

$$5^n$$

3.

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

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

5.

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

$$-\frac{(1+x)^2}{(-3+x)(5+x)}$$

## Szerda

## A

1.

$$\left(\sqrt{9 \cdot + 4 \sqrt{5}} - \sqrt{5}\right) + \sqrt{3^{\text{Log}[1/3, 4] - \text{Log}[\sqrt{3}, 2]}}$$

$$2.25$$

2.

$$\sqrt{x^3 \sqrt[4]{x \sqrt{x^{10}}} - \sqrt{x^3 \sqrt{x^3}} \quad // \text{PowerExpand}$$

0

3.

$$\text{FullSimplify}\left[\left(\frac{1}{a^2 - a b} - \frac{3 b^2}{a^4 - a b^3} - \frac{b}{a^3 + a^2 b + a b^2}\right) \left(b + \frac{a^2}{a + b}\right)\right]$$

$$\frac{1}{a}$$

4.

$$f[x_] := \text{Log}[x + 1];$$

$$g[x_] := \frac{1}{\sqrt{x^2 + 1}};$$

$$\{f[g[x]], g[f[x]], f[g[0]], g[f[0]]\}$$

$$\left\{\text{Log}\left[1 + \frac{1}{\sqrt{1 + x^2}}\right], \frac{1}{\sqrt{1 + \text{Log}[1 + x]^2}}, \text{Log}[2], 1\right\}$$

5.  $f(x) = \ln(3 - |x - 2|)$ `Reduce[3 - Abs[x - 2] > 0, x, Reals]``Reduce[3 - Abs[x - 2] == 1, x, Reals]` $-1 < x < 5$  $x == 0 \ || \ x == 4$ 

B

1.

$$\left(\sqrt{11. + 6 \sqrt{2}} - \sqrt{2}\right) + \sqrt{5^{\text{Log}[\sqrt{5}, 2] - \text{Log}[1/5, 4]}}$$

7.

2.

$$\sqrt{x^4 \sqrt[3]{x \sqrt{x^7}}} - \sqrt{x^3 \sqrt{x^5}} \quad // \text{PowerExpand}$$

0

3.

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

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

4.

$$f[x_] := e^x - 1;$$

$$g[x_] := \sqrt{x^2 + 1};$$

$$\{f[g[x]], g[f[x]], f[g[0]], g[f[0]]\}$$

$$\{-1 + e^{\sqrt{1+x^2}}, \sqrt{1 + (-1 + e^x)^2}, -1 + e, 1\}$$

5.  $f(x) = \ln(|x + 2| - 8)$ 

$$\text{Reduce}[\text{Abs}[x + 2] - 8 > 0, x, \text{Reals}]$$

$$\text{Reduce}[\text{Abs}[x + 2] - 8 == 1, x, \text{Reals}]$$

$$x < -10 \quad || \quad x > 6$$

$$x == -11 \quad || \quad x == 7$$

## Csütörtök

A

1.

$$\left(\sqrt{3} - \sqrt{4 + 2\sqrt{3}}\right) + \left(\sqrt{3}\right)^{\text{Log}[9, 1/4] - \text{Log}[1/3, 2]}$$

0.

2.

$$\text{PowerExpand}\left[\sqrt[5]{\frac{x^2 \sqrt[6]{x}}{\sqrt{x^3} \sqrt{x}}} \frac{1}{\sqrt{x}}\right]$$

$$\frac{1}{x^{5/12}}$$

3.

$$\text{FullSimplify}\left[\left(\frac{2ab}{4a^2-9b^2} + \frac{b}{3b-2a}\right) / \left(1 - \frac{2a-3b}{2a+3b}\right)\right]$$

$$-\frac{b}{4a-6b}$$

4.

$$a = 800;$$

$$\text{Reduce}[0.84t + (a - t) == 0.85a, t]$$

$$t == 750.$$

$$5. f(x) = \ln(3 + x - x^2)$$

$$\text{Reduce}[3 + x - x^2 > 0, x]$$

$$\text{Reduce}[3 + x - x^2 == 1, x]$$

$$\frac{1}{2}(1 - \sqrt{13}) < x < \frac{1}{2}(1 + \sqrt{13})$$

$$x == -1 \mid \mid x == 2$$

B

1.

$$\left(\sqrt{7} - \sqrt{8 + 2\sqrt{7}}\right) + \left(\sqrt{5}\right)^{\text{Log}[1/5,2] - \text{Log}[25,1/4]}$$

$$0.$$

2.

$$\text{PowerExpand}\left[\sqrt[3]{\frac{x^2 \sqrt{x}}{\sqrt{x^5} \sqrt{x}}} \frac{1}{\sqrt[5]{x}}\right]$$

$$\frac{1}{x^{5/12}}$$

3.

$$\text{FullSimplify}\left[\left(\frac{y}{2x+3y} + \frac{2xy}{9y^2-4x^2}\right) / \left(\frac{2x+3y}{2x-3y} - 1\right)\right]$$

$$-\frac{y}{4x+6y}$$

4.

 $a = 1200;$  $\text{Reduce}[0.84 t + (a - t) == 0.85 a, t]$  $t = 1125.$ 5.  $f(x) = \ln(x^2 - x - 5)$  $\text{Reduce}[x^2 - x - 5 > 0, x]$  $\text{Reduce}[x^2 - x - 5 == 1, x]$  $x < \frac{1}{2} (1 - \sqrt{21}) \ || \ x > \frac{1}{2} (1 + \sqrt{21})$  $x == -2 \ || \ x == 3$ 

## Péntek

A

1.

$$\sqrt[3]{4^{\text{Log}[\sqrt{2}, 3] - \text{Log}[1/4, 1/3]}} + \frac{7^9 + 7^{10}}{7^9 + 7^8} \ // \ \text{FullSimplify}$$

10

2.

$$\sqrt{x^{-2} \sqrt[3]{x^2}} \frac{\sqrt[3]{x^4 \sqrt{x^7}}}{\sqrt{x}} \ // \ \text{PowerExpand}$$
 $x^{1/3}$ 

3.

$$\text{FullSimplify}\left[\left(\frac{a^2 - ab}{a^2 b + b^3} + \frac{2a^2}{a^3 - a^2 b + ab^2 - b^3}\right)\left(\frac{a^3 - b^3}{a^2 + ab + b^2}\right)\right]$$
 $\frac{a}{b}$

5.

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

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

B

1.

$$\sqrt[9]{9^{\text{Log}[\sqrt{3}, 2] - \text{Log}[1/9, 1/4]}} - \frac{5^{10} + 5^{11}}{5^{10} + 5^9} // \text{FullSimplify}$$

$$-3$$

2.

$$\sqrt[3]{x^{-1} \sqrt{x^9}} \frac{\sqrt{x} \sqrt{x^5}}{\sqrt[3]{x^2}} // \text{PowerExpand}$$

$$x^{9/4}$$

3.

$$\text{FullSimplify}\left[\left(\frac{x^3 + y^3}{x^2 - xy + y^2}\right) \left(\frac{2x^2}{x^3 + x^2y + xy^2 + y^3} - \frac{x^2 + xy}{x^2y + y^3}\right)\right]$$

$$-\frac{x}{y}$$

5.

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

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