

Hétfő

A

1.

$$\text{Reduce}[\text{Abs}[x^2 - 4] - x^2 + x - 1 == 0, x, \text{Reals}]$$

$$x == -1 \mid \mid x == \frac{3}{2} \mid \mid x == 5$$

2.

$$\text{Reduce}\left[2^{3x-2} \frac{\sqrt{8^{x+10}}}{4^{2x+3}} == \left(\frac{1}{16}\right)^{7-x}, x, \text{Reals}\right]$$

$$x == 10$$

3.

$$\text{Reduce}[\text{Log}[1/3, x^2 - 4x + 3] \geq 0, x, \text{Reals}]$$

$$2 - \sqrt{2} \leq x < 1 \mid \mid 3 < x \leq 2 + \sqrt{2}$$

4.

$$\text{Reduce}[\text{Cos}[2x] + 3 \text{Sin}[x] == 2, x]$$

$$C[1] \in \text{Integers} \ \&\& \ \left(x == \frac{\pi}{2} + 2\pi C[1] \mid \mid x == \frac{\pi}{6} + 2\pi C[1] \mid \mid x == \frac{5\pi}{6} + 2\pi C[1] \right)$$

5.

$$\text{Solve}[\{a1 + a2 + a3 == 21, a2^2 == a1 a3, (a1 - 10) + (a3 + 1) == 2 a2\}, \{a1, a2, a3\}]$$

$$\{\{a1 \rightarrow 1, a2 \rightarrow 4, a3 \rightarrow 16\}, \{a1 \rightarrow 16, a2 \rightarrow 4, a3 \rightarrow 1\}\}$$

B

1.

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

$$x == -\frac{1}{2} \mid \mid x == 1 \mid \mid x == 5$$

2.

$$\text{Reduce}\left[3^{4x+2} \frac{\sqrt{27^{x+5}}}{9^{2x-4}} = \left(\frac{1}{81}\right)^{5-x}, x, \text{Reals}\right]$$

$$x = 15$$

3.

$$\text{Reduce}\left[\text{Log}\left[\frac{1}{2}, x^2 + 4x + 3\right] \geq 0, x, \text{Reals}\right]$$

$$-2 - \sqrt{2} \leq x < -3 \quad || \quad -1 < x \leq -2 + \sqrt{2}$$

4.

$$\text{Reduce}[\text{Cos}[2x] - 3 \text{Sin}[x] == 2, x]$$

$$C[1] \in \text{Integers} \quad \&\& \quad \left(x = -\frac{\pi}{2} + 2\pi C[1] \quad || \quad x = -\frac{5\pi}{6} + 2\pi C[1] \quad || \quad x = -\frac{\pi}{6} + 2\pi C[1]\right)$$

5.

$$\text{Solve}\left[\{a_1 + a_2 + a_3 = 21, a_2^2 = a_1 a_3, (a_1 + 1) + (a_3 - 10) = 2 a_2\}, \{a_1, a_2, a_3\}\right]$$

$$\{\{a_1 \rightarrow 1, a_2 \rightarrow 4, a_3 \rightarrow 16\}, \{a_1 \rightarrow 16, a_2 \rightarrow 4, a_3 \rightarrow 1\}\}$$

Szerda

A

1.

$$\text{Reduce}\left[\frac{x+3}{x+1} < \frac{x+1}{x}, x, \text{Reals}\right]$$

$$x < -1 \quad || \quad 0 < x < 1$$

2.

$$\text{Reduce}\left[\left(\frac{7}{3}\right)^{\text{Abs}[x]-4} \sqrt{\left(\frac{49}{9}\right)^{2x+2}} = \frac{3}{7}, x, \text{Reals}\right]$$

$$x = \frac{1}{3}$$

3.

Reduce[Log[5, x]² - Log[5, x²] - 3 == 0, x, Reals]

$$x == \frac{1}{5} \quad || \quad x == 125$$

4.

Reduce[4 Cos[x]² + 4 Sin[x] == 1, x, Reals]

$$C[1] \in \text{Integers} \ \&\& \ \left(x == -\frac{5\pi}{6} + 2\pi C[1] \quad || \quad x == -\frac{\pi}{6} + 2\pi C[1] \right)$$

5.

Solve[{(a3 - 2 d) + (a3 - d) + a3 + (a3 + d) + (a3 + 2 d) == 15,
(a3 - 2 d) (a3 + d) == (a3 - d)²}, {a3, d}]

$$\{\{a3 \rightarrow 3, d \rightarrow 1\}, \{a3 \rightarrow 3, d \rightarrow 0\}\}$$

B

1.

Reduce[$\frac{x+2}{x} > \frac{x}{x-1}$, x, Reals]

$$0 < x < 1 \quad || \quad x > 2$$

2.

Reduce[$\left(\frac{5}{2}\right)^{\text{Abs}[x]-6} \sqrt{\left(\frac{25}{4}\right)^{2x+4}} == \frac{2}{5}$, x, Reals]

$$x == \frac{1}{3}$$

3.

Reduce[Log[2, x]² + Log[2, x³] - 4 == 0, x, Reals]

$$x == \frac{1}{16} \quad || \quad x == 2$$

4.

Reduce[4 Cos[x]² - 4 Sin[x] == 1, x, Reals]

$$C[1] \in \text{Integers} \ \&\& \ \left(x == \frac{\pi}{6} + 2\pi C[1] \quad || \quad x == \frac{5\pi}{6} + 2\pi C[1] \right)$$

5.

$$\text{Reduce}\left[\left\{\left(a^3 - 2d\right) + \left(a^3 - d\right) + a^3 + \left(a^3 + d\right) + \left(a^3 + 2d\right) = 10,\right.\right. \\ \left.\left.\left(a^3 - 2d\right)\left(a^3 + d\right) = \left(a^3\right)^2\right\}, \{a^3, d\}\right] \\ (a^3 = 2 \ \&\& \ d = -1) \ || \ (d = 0 \ \&\& \ a^3 = 2)$$

Csütörtök

A

1.

$$\text{Reduce}\left[x^2 - 3 \text{Abs}[x] + x + 1 = 0, x, \text{Reals}\right]$$

$$x = 1 \ || \ x = -2 - \sqrt{3} \ || \ x = -2 + \sqrt{3}$$

2.

$$\text{Reduce}\left[\left(\frac{1}{2}\right)^{x^2 - 8x + 18} < \frac{1}{8}, x, \text{Reals}\right]$$

$$x < 3 \ || \ x > 5$$

3.

$$\text{Reduce}\left[2 \text{Log}[2, x - 3] + \text{Log}[2, x^2 - 8x + 16] = 0, x, \text{Reals}\right]$$

$$x = \frac{1}{2} (7 + \sqrt{5})$$

4.

$$\text{Reduce}\left[2 \text{Sin}[x]^2 + \text{Cos}[\pi - x] = 2, x, \text{Reals}\right]$$

$$C[1] \in \text{Integers} \ \&\&$$

$$\left(x = -\frac{\pi}{2} + 2\pi C[1] \ || \ x = \frac{\pi}{2} + 2\pi C[1] \ || \ x = -\frac{2\pi}{3} + 2\pi C[1] \ || \ x = \frac{2\pi}{3} + 2\pi C[1]\right)$$

5.

$$\text{Solve}\left[\{a_1 + a_2 + a_3 = 3, a_1 a_2 a_3 = -8, a_2^2 = a_1 a_3\}, \{a_1, a_2, a_3\}, \text{Reals}\right]$$

$$\{\{a_1 \rightarrow 1, a_2 \rightarrow -2, a_3 \rightarrow 4\}, \{a_1 \rightarrow 4, a_2 \rightarrow -2, a_3 \rightarrow 1\}\}$$

B

1.

$$\text{Reduce}[x^2 - 3 \text{Abs}[x] - x + 1 == 0, x, \text{Reals}]$$

$$x == -1 \ || \ x == 2 - \sqrt{3} \ || \ x == 2 + \sqrt{3}$$

2.

$$\text{Reduce}\left[\left(\frac{1}{3}\right)^{x^2-6x-4} > \frac{1}{27}, x, \text{Reals}\right]$$

$$-1 < x < 7$$

3.

$$\text{Reduce}[2 \text{Log}[7, x - 2] + \text{Log}[7, x^2 - 6x + 9] == 0, x, \text{Reals}]$$

$$x == \frac{1}{2} (5 + \sqrt{5})$$

4.

$$\text{Reduce}[2 \text{Cos}[x]^2 + \text{Sin}[\pi - x] == 2, x, \text{Reals}]$$

$$(C[1] \in \text{Integers} \ \&\& \ x == \pi + 2 \pi C[1]) \ ||$$

$$\left(C[1] \in \text{Integers} \ \&\& \ \left(x == 2 \pi C[1] \ || \ x == \frac{\pi}{6} + 2 \pi C[1] \ || \ x == \frac{5 \pi}{6} + 2 \pi C[1] \right) \right)$$

5.

$$\text{Solve}[\{a1 + a2 + a3 == 7, a1 a2 a3 == -27, a2^2 == a1 a3\}, \{a1, a2, a3\}, \text{Reals}]$$

$$\{\{a1 \rightarrow 1, a2 \rightarrow -3, a3 \rightarrow 9\}, \{a1 \rightarrow 9, a2 \rightarrow -3, a3 \rightarrow 1\}\}$$

Péntek

A

1.

$$\text{Reduce}\left[x + 3 + \frac{6}{x-4} > 0\right]$$

$$-2 < x < 3 \ || \ x > 4$$

2.

$$\text{Reduce}\left[\left(\frac{1}{4}\right)^{x+2} \frac{\sqrt{2^{x+1}}}{8^x} = \left(\frac{1}{2}\right)^{1+5x}, x, \text{Reals}\right]$$

$$x = 5$$

3.

$$\text{Reduce}\left[\text{Log}\left[\frac{1}{4}, 2 \text{Log}\left[2, 3 + \text{Log}\left[\frac{1}{5}, x\right]\right]\right]\right] = -\frac{1}{2}, x]$$

$$x = 5$$

4.

$$\text{Reduce}[\text{Cos}[2x] = 2 \text{Sin}[x] + 1, x]$$

$$C[1] \in \text{Integers} \&\& \left(x = -\frac{\pi}{2} + 2\pi C[1] \mid\mid x = 2\pi C[1] \mid\mid x = \pi + 2\pi C[1]\right)$$

5.

$$\text{Solve}[\{a1 + a2 + a3 = 12, a1 + a3 = 2 a2, (a1 - 4)(a3 + 6) = a2^2\}, \{a1, a2, a3\}]$$

$$\{\{a1 \rightarrow 6, a2 \rightarrow 4, a3 \rightarrow 2\}, \{a1 \rightarrow 12, a2 \rightarrow 4, a3 \rightarrow -4\}\}$$

B

1.

$$\text{Reduce}\left[x - 2 - \frac{8}{x+5} < 0\right]$$

$$x < -6 \mid\mid -5 < x < 3$$

2.

$$\text{Reduce}\left[\left(\frac{1}{9}\right)^{x+1} \frac{27^x}{\sqrt{3^{x-1}}} = \left(\frac{1}{3}\right)^{1+2x}, x, \text{Reals}\right]$$

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

3.

$$\text{Reduce}\left[\text{Log}\left[\frac{1}{8}, 4 \text{Log}\left[4, 1 - \text{Log}\left[\frac{1}{2}, x\right]\right]\right]\right] = -\frac{1}{3}, x]$$

$$x = 2$$

4.

Reduce[Cos[2 x] == 2 Cos[x] - 1, x, Reals]

$$C[1] \in \text{Integers} \ \&\& \ \left(x = -\frac{\pi}{2} + 2\pi C[1] \ || \ x = 2\pi C[1] \ || \ x = \frac{\pi}{2} + 2\pi C[1] \right)$$

5.

Solve[{a1 + a2 + a3 == 9, a1 + a3 == 2 a2, (a1 - 3) (a3 + 7) == a2²}, {a1, a2, a3}]

$$\{\{a1 \rightarrow 4, a2 \rightarrow 3, a3 \rightarrow 2\}, \{a1 \rightarrow 12, a2 \rightarrow 3, a3 \rightarrow -6\}\}$$