Lösungen

1

```
1000 x - x
```

999 x

```
x = 32.8146846846846846846846846846846846468468468;
y = 1000 x - x
```

32781.870000000000000000000000000000000000

```
z = y // Chop// Rationalize;  z
```

$$\frac{3278187}{100}$$

```
Clear[x];
Solve[1000 x - x == z, {x}] // Flatten
```

$$\left\{x \to \frac{364243}{11100}\right\}$$

```
Remove["Global`*"]
```

2

```
Ln[x_]:=Log[x]; Ln[E]
```

1

```
Log[3,2^(Log[4,b])] Ln[9] / Ln[b] - Log[x,x/x^(Ln[a]) a^(Ln[x])]+1
```

$$1 + \frac{\text{Log}[9]\,\text{Log}\left[2^{\frac{\text{Log}[b]}{\text{Log}[4]}}\right]}{\text{Log}[3]\,\text{Log}[b]} - \frac{\text{Log}\left[a^{\text{Log}[x]}\,x^{1-\text{Log}[a]}\right]}{\text{Log}[x]}$$

```
u=Log[3,2^(Log[4,b])] Ln[9] / Ln[b] - Log[x,x/x^(Ln[a]) a^(Ln[x])]+1 //Simplify
```

$$\frac{\text{Log}[9]\,\text{Log}\left[2^{\frac{\text{Log}[b]}{\text{Log}[4]}}\right]}{\text{Log}[3]\,\text{Log}[b]}$$

```
u=u/.{Log[4]->2 Log[2], Log[9]->2 Log[3]}
```

$$\frac{2\,\text{Log}\left[\sqrt{b}\right]}{\text{Log}[b]}$$

```
u/.b->E
```

1

```
Remove["Global`*"]
```

3

```
Lg[x_]:=Log[10,x]; Lg[100]
```

2

```
Solve[(1-Lg[Lg[x]])(Log[4,Log[3,x]]+1)==0,{x}]
```

$\{\{x \to 10000000000\}, \{x \to 3^{1/4}\}\}$

```
ScientificForm[10000000000.]
```

$1. \times 10^{10}$

```
Remove["Global`*"]
```

4

```
Lg[x_]:=Log[10,x];
```

```
Solve[{10 == y^(Lg[Sqrt[y]]), Lg[x+2]+Lg[x-5] == Lg[x-1]+Lg[2-x]}, {x,y}]
```

Solve::ifun : Inverse functions are being used by Solve, so some
   solutions may not be found; use Reduce for complete solution information. Mehr…

$\left\{\left\{x \to -1, y \to 10^{-\sqrt{2}}\right\}, \left\{x \to -1, y \to 10^{\sqrt{2}}\right\}, \left\{x \to 4, y \to 10^{-\sqrt{2}}\right\}, \left\{x \to 4, y \to 10^{\sqrt{2}}\right\}\right\}$

```
Remove["Global`*"]
```

5

```
Ln[x_]:=Log[x];
```

```
Ln[x^5]+6 /. {Log[x^5]->5 Log[x]}
```

$6 + 5 \log[x]$

```
Solve[0 == (Ln[x]^2+Ln[x^5]+6 /. {Log[x^5]->5 Log[x]}), {x}]
```

$\left\{\left\{x \to \frac{1}{e^3}\right\}, \left\{x \to \frac{1}{e^2}\right\}\right\}$

```
Remove["Global`*"]
```

6

```
Solve[3^(4(x-1)) 2^(3x) 4^(1-2x) == 5^(5-2x),{x}]
```

Solve::ifun : Inverse functions are being used by Solve, so some
   solutions may not be found; use Reduce for complete solution information. Mehr…

$$\left\{\left\{x \to -\frac{\text{Log}\left[\frac{253125}{4}\right]}{\text{Log}[2] - 4\,\text{Log}[3] - 2\,\text{Log}[5]}\right\}\right\}$$

```
Simplify[%]
```

$$\left\{\left\{x \to \frac{\text{Log}\left[\frac{253125}{4}\right]}{\text{Log}\left[\frac{2025}{2}\right]}\right\}\right\}$$

```
% // N
```

$$\{\{x \to 1.59755\}\}$$

```
FactorInteger[253125]
```

$$\{\{3, 4\}, \{5, 5\}\}$$

```
3^4 5^5
```

253125

```
FactorInteger[2025]
```

$$\{\{3, 4\}, \{5, 2\}\}$$

```
(4 Log[3] + 5 Log[5]-2 Log[2])/(4 Log[3] + 2 Log[5]- Log[2])
```

$$\frac{-2\,\text{Log}[2] + 4\,\text{Log}[3] + 5\,\text{Log}[5]}{-\text{Log}[2] + 4\,\text{Log}[3] + 2\,\text{Log}[5]}$$

```
% // N
```

1.59755

```
1+ (3 Log[5]-Log[2])/(4 Log[3] + 2 Log[5]- Log[2])
```

$$1 + \frac{-\text{Log}[2] + 3\,\text{Log}[5]}{-\text{Log}[2] + 4\,\text{Log}[3] + 2\,\text{Log}[5]}$$

```
% // N
```

1.59755

```
Remove["Global`*"]
```

7

```
Solve[18+16 u+16 u x +32 x^2==0, {x}]
```

$$\left\{\left\{x \to \frac{1}{4}\left(-u - \sqrt{-9 - 8\,u + u^2}\right)\right\}, \left\{x \to \frac{1}{4}\left(-u + \sqrt{-9 - 8\,u + u^2}\right)\right\}\right\}$$

```
Solve[-9 - 8 u + u^2 == 0, {u}]
```

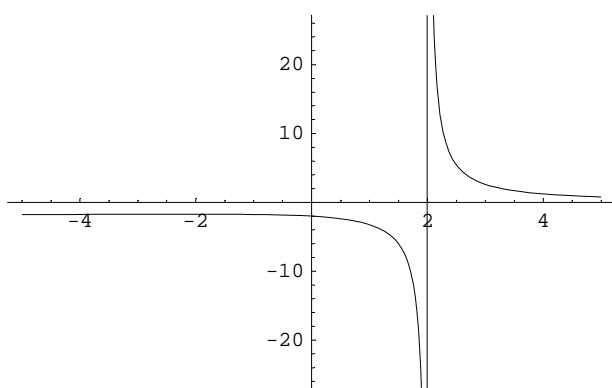$\{\{u \to -1\}, \{u \to 9\}\}$

```
Remove["Global`*"]
```

8

```
Solve[(Sqrt[x^2+4]-x+2)/(x-2)==0,{x}]
```

$\{\}$

```
Solve[(Sqrt[x^2+4]-x+2)==0,{x}]
```

$\{\}$

```
Plot[(Sqrt[x^2+4]-x+2)/(x-2),{x,-5,5}];
```



```
Remove["Global`*"]
```

9

```
Solve[Abs[s^2-2]==12,{s}]
```

Solve::ifun : Inverse functions are being used by Solve, so some
    solutions may not be found; use Reduce for complete solution information. Mehr…

$\left\{\left\{s \to -\dot{\imath} \sqrt{10}\right\}, \left\{s \to \dot{\imath} \sqrt{10}\right\}, \left\{s \to -\sqrt{14}\right\}, \left\{s \to \sqrt{14}\right\}\right\}$

```
Remove["Global`*"]
```

10

```
Solve[{
2a1+5a2-3a3==0,
4a1-2a2==6,
4a1-4a2+a3==7},{a1,a2,a3}] // Flatten
```

Solve::svars : Equations may not give solutions for all "solve" variables. Mehr…

$$\left\{a1 \rightarrow \frac{5}{4} + \frac{a3}{4}, \, a2 \rightarrow -\frac{1}{2} + \frac{a3}{2}\right\}$$

Erste Gleichung -5 statt +5 bei a2:

```
Solve[{
2a1-5a2-3a3==0,
4a1-2a2==6,
4a1-4a2+a3==7},{a1,a2,a3}] // Flatten
```

$$\left\{a1 \rightarrow \frac{3}{2}, \, a2 \rightarrow 0, \, a3 \rightarrow 1\right\}$$

```
Remove["Global`*"]
```

11

```
M = {}
```

{}