



LOGARITHMISCHE GLEICHUNGEN

Einfache logarithmische Gleichungen

Aufgabe 1.1: versuche diese 4 Aufgaben ohne Taschenrechner !

(a) $\log_{\sqrt[3]{5}} \frac{1}{25} = x$

(b) $\log_{\sqrt[3]{25}} \frac{1}{\sqrt{5}} = x$

(c) $\log_{\frac{1}{3}} 9 = x$

(d) $\log_{a^2} \sqrt[3]{a} = x$

A

Aufgabe 1.2:

(a) $\log_x 512 = 9$

(b) $\log_x 16 = 4$

(c) $\log_x 27 = 3$;

(d) $\log_x 2 = 4$

(e) $\log_x 64 = 4$

(f) $\log_x 9 = 4$

A

Aufgabe 1.3:

(a) $\log_{25} x = -\frac{1}{2}$

$\log_{\sqrt{3}} x = 8$

$\log_{\sqrt{5}} x = 6$

$\log_9 x = \frac{1}{4}$

(b) $\log_2 x = -5$

$\log_{\sqrt{3}} x = -3$

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

$\log_{\sqrt[3]{4}} x = 2$

(c) $\log_{64} x = \frac{2}{3}$

$\log_{25} x = -\frac{1}{4}$

$\log_{125} x = \frac{4}{3}$

$\log_{32} x = 0,2$

A

Lösungsmenge:

{-6}	{-2}	{-0,75}	{ $\frac{1}{32}$ }	{0,19}	{ $\frac{1}{6}$ }	{ $\frac{1}{5}$ }	{ $\frac{1}{\sqrt{5}} \approx 0,45$ }
{ $\sqrt[4]{2} \approx 1,19$ }	{ $\sqrt{3} \approx 1,73$ }	{ $\sqrt{3} \approx 1,73$ }	2	2	2	{ $2 \cdot \sqrt[3]{2} \approx 2,52$ }	{ $\sqrt{8} \approx 2,82$ }
3	9	16	81	125	625		

Diese Gleichungen werden einfach durch Delogarithmieren gelöst !

Aufgabe 2.1:

(a) $\log_3 (2x - \frac{5}{3}) = -1$

(b) $\log_3 (x + 80) = 4$

(c) $\log_5 (x + 1) = 3$

(d) $\log_4 (5x - 1) = -1$

(e) $\log_2 (x^2 - 1) = 4$

(f) $\log_5 x^2 = 3$

(g) $\log_{\sqrt{2}} (x^2 - 1) = 4$

(h) $\log_{\sqrt[3]{2}} (x^2 + 1) = 6$

M



LOGARITHMISCHE GLEICHUNGEN

Aufgabe 2.2:

- | | |
|--|---|
| (a) $\log_x(6-x) = 2$ | (b) $\log_x\left(x - \frac{8}{3}\right) = -1$ |
| (c) $\log_x(x+6) = 2$ | (d) $\log_x(10-3x) = 2$ |
| (e) $\log_x\left(x - \frac{15}{4}\right) = -1$ | (f) $\log_x(x+2) = 2$ |
| (g) $\log_x(x+6) = 2$ | (h) $\log_x(15-2x) = 2$ |

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Lösungsmenge:

{ $\pm 5\sqrt{5} \approx \pm 11,18$ }	{ $\pm\sqrt{17} \approx \pm 4,12$ }	{ $\pm\sqrt{5} \approx \pm 2,24$ }	{ $\pm\sqrt{3} \approx \pm 1,73$ }	{0,25}	{1}
{1}	{2}	{2}	{2}	{3}	{3}
{3}	{3}	{ $\sqrt{10} \approx 3,16$ }	{4}		

Log-Gleichungen mit Summen und Differenzen

Aufgabe 3.1:

- | | |
|--|---|
| (a) $\log_2(x-3) + \log_2(x+4) = 3$ | (b) $\log_2(x-5) + \log_2(x+3) = 3$ |
| (c) $\log_9(x-4) + \log_9(x-2) = \frac{1}{2}$ | (d) $\log_7(x-2) + \log_7(x+4) = 1$ |
| (e) $\lg x + \lg(x+4) = \lg 21$ | (f) $\log_4(x+3) + \log_4(x+2) = \frac{1}{2}$ |
| (g) $\log_x 2 + \log_x(x+12) = 2$ | (h) $\log_6(x+2) + \log_6(x-3) = 1$ |
| (i) $\log_6(x+4) + \log_6(x-4) = 1 + \log_6 x$ | |

E

Aufgabe 3.2:

- | | |
|--|---|
| a) $\log_4(x+2) - \log_4(x-1) = \frac{1}{2}$ | (b) $\log_5(x+2) - \log_5(x-2) = 1$ |
| (c) $\log_3(x^2-9) - \log_3(x+3) = 3$ | (d) $\log_2(x-4) - \log_2(x^2-16) = -4$ |

E

Lösungsmenge:

{-1}	{0}	{3}	{3}	{3}	{4}	{4}	{4}
{4}	{5}	{6}	{6}	{8}	{12}	{30}	{125}