Lösen eines LGS

16.3.20

1) $\begin{cases} 2y = 70 & |\cdot 5 \\ 3x - 5y = 8 & |\cdot 2 \end{cases}$

$\begin{cases} 10y = 350 & \text{↓} \\ 6x - 10y = 16 & \text{↓} \end{cases}$

$\begin{cases} 10y = 350 & |:10 \\ 6x = 66 & |:6 \end{cases}$

$\begin{cases} y = 35 \\ x = 11 \end{cases}$

Überprüfung:

$3 \cdot 11 - 5 \cdot 5 = 8$ ✓

$33 - 25 = 8$ ✓

$8 = 8$ ✓

1) $\begin{cases} 2y = 70 & |:2 \\ 3x - 5y = 8 & |-3x:(-5) \end{cases}$

$\begin{cases} y = 35 \\ y = \frac{8}{5} + \frac{3}{5}x \\ y = 35 \\ 35 = \frac{8}{5} + \frac{3}{5}x & |+\frac{8}{5} \quad :\frac{3}{5} \\ y = 35 \\ \frac{165}{5} = x \\ y = 35 \\ x = 11 \end{cases}$

1) $\begin{cases} 2y = 70 & |:2 \\ 3x - 5y = 8 \end{cases}$

$\begin{cases} y = 35 \\ 3x - 5y = 8 \\ y = 35 \\ 3x - 5 \cdot 35 = 8 \\ y = 35 \\ 3x - 25 = 8 & |+25 \quad :3 \\ y = 35 \\ x = 11 \end{cases}$

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2) $\begin{cases} 4x+4y=3 \\ 4x-8y=-3 \quad |\cdot(-1) \end{cases}$ $\Big]+$

$\begin{cases} 12y=6 \quad |:3 \\ -4x+8y=3 \quad |:2 \end{cases}$

$\begin{cases} 4y=2 \quad |\cdot(-1) \\ -2x+4y=\frac{3}{2} \end{cases}$ $\Big]+$

$\begin{cases} -4y=-2 \quad |:(-4) \\ -2x=-\frac{1}{2} \quad |:(-2) \end{cases}$

$\begin{cases} y=\frac{1}{2} \\ x=\frac{1}{4} \end{cases}$

2) $\begin{cases} 4x+4y=3 \quad |-4x:4 \\ 4x-8y=-3 \quad |-4x:(-8) \end{cases}$

$\begin{cases} y=\frac{3-4x}{4} \\ y=\frac{-3-4x}{-8} \end{cases}$

$\begin{cases} y=\frac{3-4x}{4} \\ \frac{3-4x}{4}=\frac{-3-4x}{-8} \end{cases}$

$\begin{cases} y=\frac{3-4x}{4} \\ -8\cdot(3-4x)=4\cdot(-3-4x) \end{cases}$

$\begin{cases} y=\frac{3-4x}{4} \\ -24+32x=-12-16x \quad |+12-32x \end{cases}$

$\begin{cases} y=\frac{3+4x}{4} \\ -72=-48x \quad |:(-48) \end{cases}$

$\begin{cases} y=\frac{3-4x}{4} \\ \frac{12}{48}=x \end{cases}$

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2) (weiter)

$$\begin{cases} y = \frac{3-4x}{4} \\ x = \frac{1}{4} \end{cases}$$

$$\begin{cases} y = \frac{3-4\cdot\frac{1}{4}}{4} \\ x = \frac{1}{4} \end{cases}$$

$$\begin{cases} y = \frac{1}{2} \\ x = \frac{1}{4} \end{cases}$$

Überprüfung:

$4\cdot\frac{1}{4} + 4\cdot\frac{1}{2} = 3$ ✓

$1 + 2 = 3$ ✓

$3 = 3$

2) $\begin{cases} 4x+4y=3 & |-4x:4 \\ 4x-8y=-3 \end{cases}$

$$\begin{cases} y = \frac{3-4x}{4} \\ 4x-8y=-3 \end{cases}$$

$$\begin{cases} y = \frac{3-4x}{4} \\ 4x-8\left(\frac{3-4x}{4}\right) = -3 \end{cases}$$

$$\begin{cases} y = \frac{3-4x}{4} \\ 4x-\left(\frac{3-4x}{1}\right) = -3 & |\cdot\frac{1}{2} \end{cases}$$

$$\begin{cases} y = \frac{3-4x}{4} \\ 2x-3+4x = -\frac{3}{2} & |+3:6 \end{cases}$$

$$\begin{cases} y = \frac{3-4x}{4} \\ x = \frac{3}{2}\cdot\frac{1}{6} = \frac{1}{4} \end{cases}$$

$$\begin{cases} y = \frac{2}{4} = \frac{1}{2} \\ x = \frac{1}{4} \end{cases}$$

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3) $\begin{cases} -2x+3y=-7 & \text{G}_+ \\ 2x=-2 \end{cases}$

$\begin{cases} 2x=-2 & 1:2 \\ 3y=-3 & 1:3 \\ x=-1 \\ y=-1 \end{cases}$

Überprüfung:

$-2\cdot(-1)+3\cdot(-1)=-7$ II

$2-3=-7$ II

$-7=-7$

3) $\begin{cases} -2x+3y=-7 & \mid -3y \mid :(-2) \\ 2x=-2 & 1:2 \end{cases}$

$\begin{cases} x=\frac{7}{2}+\frac{3}{2}y \\ x=-1 \\ -1=\frac{7}{2}+\frac{3}{2}y & \mid \frac{7}{2} \\ x=-1 \\ -\frac{3}{2}=-\frac{3}{2}y & \mid :\frac{3}{2} \\ x=-1 \\ y=-1 \end{cases}$

3) $\begin{cases} -2x+3y=-7 \\ 2x=-2 & 1:2 \end{cases}$

$\begin{cases} -2x+3y=-7 \\ x=-1 \\ x=-1 \\ -2\cdot(-1)+3y=-7 & \mid -2 \mid :3 \\ x=-1 \\ y=-3 \end{cases}$

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4)
$$\begin{cases} \frac{1}{2}y = 2 & |:3 \\ \frac{1}{4}x - \frac{1}{3}y = 7 & |:2 \end{cases} +$$

$$\begin{cases} \frac{1}{6}y = \frac{2}{3} & |:\frac{1}{6} \\ \frac{1}{8}x = \frac{7}{2} + \frac{2}{3} \end{cases}$$

$$\begin{cases} y = 4 \\ \frac{1}{8}x = \frac{21}{6} + \frac{4}{6} & |:\frac{1}{8} \end{cases}$$

$$\begin{cases} y = 4 \\ x = \frac{100}{3} \end{cases}$$

Überprüfung:

$$\frac{1}{4} \cdot \frac{100}{3} - \frac{1}{3} \cdot 4 = 7 \quad | \top$$

$$\frac{100}{12} - \frac{4}{3} = 7 \quad | \top$$

$$\frac{100}{12} - \frac{16}{12} = 7 \quad | \top$$

$$\frac{84}{12} = 7 \quad | \top$$

$$7 = 7$$

4)
$$\begin{cases} \frac{1}{2}y = 2 & |:\frac{1}{2} \\ \frac{1}{4}x - \frac{1}{3}y = 7 \end{cases}$$

$$\begin{cases} y = 4 \\ \frac{1}{4}x - \frac{1}{3} \cdot 4 = 7 & |+\frac{4}{3} \end{cases}$$

$$\begin{cases} y = 4 \\ \frac{1}{4}x = \frac{25}{3} & |:\frac{1}{4} \end{cases}$$

$$\begin{cases} y = 4 \\ x = \frac{100}{3} \end{cases}$$

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4)
$$\begin{cases} \frac{1}{2}y = 2 & |:\frac{1}{2} \\ \frac{1}{4}x - \frac{1}{3}y = 7 & |-\frac{1}{4}x \end{cases}$$

$$y = 4$$

$$\begin{cases} -\frac{1}{3}y = 7 - \frac{1}{4}x & |:(-\frac{1}{3}) \\ y = 4 \end{cases}$$

$$y = -\frac{27}{3} + \frac{3}{4}x$$

Rechenfehler 7:(1/3)=21

$$\begin{cases} y = 4 \\ 4 = -\frac{27}{3} + \frac{3}{4}x & |+\frac{27}{3} \end{cases}$$

$$\begin{cases} y = 4 \\ \frac{33}{3} = \frac{3}{4}x & |:\frac{3}{4} \end{cases}$$

$$\begin{cases} y = 4 \\ x = \frac{132}{9} = \frac{44}{3} \end{cases}$$

„Überprüfung:

$\frac{1}{4} \cdot \frac{44}{3} - \frac{1}{3} \cdot 4 = 7$ ✓

$\frac{44}{12} - \frac{4}{3} = 7$ ✓

$\frac{44}{12} - \frac{16}{12} = 7$ ✓

$\frac{28}{12} = 7$ ✗

Lösen eines LGS

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5) $\begin{cases} 9x - \frac{2}{3}y = 3 & | + \frac{2}{3}y \\ \frac{3}{4}x - 2y = 5 \end{cases}$

$\begin{cases} 9x = 3 + \frac{2}{3}y & | :9 \\ \frac{3}{4}x - 2y = 5 \end{cases}$

$\begin{cases} x = \frac{3 + \frac{2}{3}y}{9} \\ \frac{3}{4}x - 2y = 5 \end{cases}$

$\begin{cases} x = \frac{3 + \frac{2}{3}y}{9} \\ \frac{3}{4} \cdot \left(\frac{3 + \frac{2}{3}y}{9}\right) - 2y = 5 & | : \frac{3}{4} \cdot 9 \end{cases}$

bis hierher korrekt

$\begin{cases} x = \frac{3 + \frac{2}{3}y}{9} \\ 3 + \frac{2}{3}y - \frac{35}{3}y = \frac{47}{3} & | -3 \end{cases}$

lässt sich hier nicht nachvollziehen
wie man auf 35/3 und 47/3 kommt.
2*(4/3)*9 = 72/3, hier korrigieren

$\begin{cases} x = \frac{3 + \frac{2}{3}y}{9} \\ 11y = \frac{188}{3} & | :11 \end{cases}$

$\begin{cases} x = \frac{3 + \frac{2}{3}y}{9} \\ y = \frac{188}{33} \end{cases}$

Lösen eines LGS

17.3.20

5) (weiter)

$$\begin{cases} x = 3 + \frac{2}{3}y \\ y = \frac{38}{33} \end{cases}$$

$$\begin{cases} x = 3 + \frac{2}{3} \cdot \frac{38}{33} \\ y = \frac{38}{33} \end{cases}$$

$$\begin{cases} x = 3 + \frac{76}{99} \\ y = \frac{38}{33} \end{cases}$$

$$\begin{cases} x = \frac{373}{99} \\ y = \frac{38}{33} \end{cases}$$

$$\begin{cases} y = \frac{38}{33} \\ x = \frac{273}{99} \end{cases}$$

Lösen eines LGS

7.3.20

5)

$$\begin{cases} 9x - \frac{2}{3}y = 3 & |\cdot(-3) \\ \frac{3}{4}x - 2y = 5 \end{cases}$$

$$\begin{cases} -27x + 2y = -9 \\ \frac{3}{4}x - 2y = 5 \end{cases} \quad +$$

$$\begin{cases} -27x + 2y = -9 \\ -\frac{105}{4}x = -4 & |:(-\frac{105}{4}) \end{cases}$$

$$\begin{cases} -27x + 2y = -9 \\ x = \frac{121}{4} \end{cases}$$

$$\begin{cases} -27 \cdot (\frac{121}{4}) + 2y = -9 \\ x = \frac{121}{4} \end{cases}$$

$$\begin{cases} -\frac{229}{4} + 2y = -9 & |+\frac{229}{4} \\ x = \frac{121}{4} \end{cases}$$

$$\begin{cases} 2y = -\frac{265}{4} & |:2 \\ x = \frac{121}{4} \end{cases}$$

$$\begin{cases} y = -\frac{265}{8} \\ x = \frac{121}{4} \end{cases}$$

Lösen eines LGS

17.3.20

5) $\begin{cases} 9x - \frac{2}{3}y = 3 & |+\frac{2}{3}y : 9 \\ \frac{3}{4}x - 2y = 5 & |+2y : \frac{3}{4} \end{cases}$

$\begin{cases} x = \frac{3 + \frac{2}{3}y}{9} \\ x = \frac{5 + 2y}{\frac{3}{4}} \end{cases}$

$\begin{cases} x = \frac{3 + \frac{2}{3}y}{9} \\ \frac{3 + \frac{2}{3}y}{9} = \frac{3 + 2y}{\frac{3}{4}} \end{cases}$

$\begin{cases} x = \frac{3 + \frac{2}{3}y}{9} \\ \frac{3}{9} + \frac{2}{27}y = \frac{12}{3} + \frac{8}{3}y & |-\frac{12}{3} - \frac{2}{27}y \end{cases}$

$\begin{cases} x = \frac{3}{9} + \frac{2}{27}y \\ -\frac{11}{3} = \frac{70}{27}y & |:\frac{70}{27} \end{cases}$

$\begin{cases} x = \frac{3}{9} + \frac{2}{27}y \\ -\frac{297}{770} = y \end{cases}$

Lösen eines LGS

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5) (weiter)

$$\begin{cases} x = \frac{3}{9} + \frac{2}{27} \cdot \left(\frac{297}{210}\right) \\ y = -\frac{297}{210} \end{cases}$$

$$\begin{cases} x = \frac{594}{5670} + \frac{3}{9} \\ y = -\frac{297}{210} \end{cases}$$

$$\begin{cases} x = \frac{2484}{5670} \\ y = -\frac{297}{210} \end{cases}$$

Lösen eines LGS

17.3.20

6)

$$\begin{cases} \frac{3}{12}x + \frac{3}{4}y = \frac{1}{12} \\ \frac{1}{7}x = 4 \quad | \cdot \frac{1}{7} \end{cases}$$

$$\begin{cases} \frac{3}{12}x + \frac{3}{4}y = \frac{1}{12} \\ x = \frac{4}{\frac{1}{7}} \end{cases}$$

$$\begin{cases} \frac{3}{12} \cdot \left(\frac{4}{\frac{1}{7}}\right) + \frac{3}{4}y = \frac{1}{12} \\ x = \frac{4}{\frac{1}{7}} \end{cases}$$

$$\begin{cases} \frac{12}{84} + \frac{3}{4}y = \frac{1}{12} \quad | - \frac{12}{84} \\ x = \frac{4}{\frac{1}{7}} \end{cases}$$

$$\begin{cases} \frac{3}{4}y = -\frac{5}{84} \quad | : \frac{3}{4} \\ x = \frac{4}{\frac{1}{7}} \end{cases}$$

$$\begin{cases} y = -\frac{20}{252} = -\frac{5}{63} \\ x = \frac{4}{\frac{1}{7}} \end{cases}$$

wurde in dem Video besprochen
4:(1/7) = 4*(7/1) = 28

korrigieren und neu machen

Lösen eines LGS

17.3.20

b) $\begin{cases} \frac{2}{12}x + \frac{3}{4}y = \frac{1}{12} & \left| -\frac{3}{4}y : \frac{2}{12} \right. \\ \frac{1}{7}x = 4 & \left| : \frac{1}{7} \right. \end{cases}$

$\begin{cases} x = \frac{12}{24} - \frac{36}{8}y \\ x = \frac{4}{\frac{1}{7}} \end{cases}$

$\begin{cases} \frac{4}{\frac{1}{7}} = \frac{12}{24} - \frac{36}{8}y & \left| -\frac{12}{24} \right. \\ x = \frac{4}{\frac{1}{7}} \end{cases}$

$\begin{cases} \frac{12}{168} = -\frac{36}{8}y & \left| : \left(\frac{36}{8}\right) \right. \\ x = \frac{4}{\frac{1}{7}} \end{cases}$

$\begin{cases} y = -\frac{8}{504} \\ x = \frac{4}{\frac{1}{7}} \end{cases}$

Lösen eines LGS

7.3.20

6) $\begin{cases} \frac{2}{12}x + \frac{3}{4}y = \frac{7}{12} & |:7 \\ \frac{1}{7}x = 4 & |:12 \end{cases}$

$\begin{cases} \frac{2}{84}x + \frac{3}{28}y = \frac{1}{84} \\ \frac{1}{84}x = \frac{4}{12} & |\cdot 2 \\ \frac{2}{84}x + \frac{3}{28}y = \frac{1}{84} \\ \frac{2}{84}x = \frac{8}{12} \end{cases}$ $\Big]+$

$\begin{cases} \frac{3}{28}y = \frac{57}{84} & |:\frac{3}{28} \\ \frac{2}{84}x = \frac{8}{12} & |:\frac{2}{84} \end{cases}$

$y = \frac{1596}{252}$

$x = \frac{84}{6}$

$y = \frac{19}{7}$

$x = 14$