3. Bez Bruchgleichungen Lösungen AB 1

1. $$\begin{aligned} 1-\frac{4-x}{5} &= \frac{x-1}{4} && /\cdot 20 \\ 20-4(4-x) &= 5(x-1) \\ 20-16+4x &= 5x-5 \\ 4+4x &= 5x-5 && /-4x \\ 4 &= x-5 && /+5 \\ \underline{\underline{9 &= x}} \end{aligned}$$

2. $$\begin{aligned} \frac{x-2}{3}-\frac{x+1}{5} &= -\frac{1}{3} && /\cdot 15 \\ 5(x-2)-3(x+1) &= -5 \\ 5x-10-3x-3 &= -5 \\ 2x-13 &= -5 && /+13 \\ 2x &= 8 && /:2 \\ \underline{\underline{x &= 4}} \end{aligned}$$

3. $$\begin{aligned} \frac{x}{3}+\frac{x-5}{7} &= 5 && /\cdot 21 \\ 7x+3(x-5) &= 105 \\ 7x+3x-15 &= 105 \\ 10x-15 &= 105 && /+15 \\ 10x &= 120 && /:10 \\ \underline{\underline{x &= 12}} \end{aligned}$$

4. $$\begin{aligned} \frac{3u}{4}-\frac{u+6}{14} &= 24 && /\cdot 28 \\ 21u-2(u+6) &= 672 \\ 21u-2u-12 &= 672 \\ 19u-12 &= 672 && /+12 \\ 19u &= 684 && /:19 \\ \underline{\underline{u &= 36}} \end{aligned}$$

5. $\frac{2x-3}{15} = \frac{3x+8}{10} - \frac{x-9}{3} \quad /\cdot 30$

$2(2x-3) = 3(3x+8) - 10(x-9)$

$4x - 6 = 9x + 24 - 10x + 90$

$4x - 6 = -x + 114 \quad /+x$

$5x - 6 = 114 \quad /+6$

$5x = 120 \quad /:5$

$\underline{\underline{x = 24}}$

6. $\frac{7z-15}{16} - \frac{5z-21}{24} - \frac{33-z}{12} = 0 \quad /\cdot 48$

$3(7z-15) - 2(5z-21) - 4(33-z) = 0$

$21z - 45 - 10z + 42 - 132 + 4z = 0$

$15z - 135 = 0 \quad /+135$

$15z = 135 \quad /:15$

$\underline{\underline{z = 9}}$

7. $\frac{4-t}{3} - 1 = -\frac{t}{12} \quad /\cdot 12$

$4(4-t) - 12 = -t$

$16 - 4t - 12 = -t$

$4 - 4t = -t \quad /+4t$

$4 = 3t \quad /:3$

$\underline{\underline{\frac{4}{3} = t}}$

8. $\frac{1-2z}{9} = \frac{1-3z}{6} - \frac{1}{3} \quad /\cdot 18$

$2(1-2z) = 3(1-3z) - 6$

$2 - 4z = 3 - 9z - 6$

$2 - 4z = -3 - 9z \quad /+9z$

$2 + 5z = -3 \quad /-2$

$5z = -5 \quad /:5$

$\underline{\underline{z = -1}}$

9.
$$\frac{6+y}{4}+\frac{10-y}{6} = 3 \qquad /\cdot 12$$
$$3(6+y)+2(10-y) = 36$$
$$18+3y+20-2y = 36$$
$$y+38 = 36 \qquad /-38$$
$$\underline{\underline{y = -2}}$$

10.
$$2 = \frac{4x+1}{6}+\frac{23+3x}{8} \qquad /\cdot 24$$
$$48 = 4(4x+1)+3(23+3x)$$
$$48 = 16x+4+69+9x$$
$$48 = 25x+73 \qquad /-73$$
$$-25 = 25x \qquad /:25$$
$$\underline{\underline{-1 = x}}$$

11.
$$\frac{u+2}{24}-\frac{u-3}{16} = 0 \qquad /\cdot 48$$
$$2(u+2)-3(u-3) = 0$$
$$2u+4-3u+9 = 0$$
$$-u+13 = 0 \qquad /+u$$
$$\underline{\underline{13 = u}}$$

12.
$$\frac{22x-14}{12} = \frac{8x+7}{5} \qquad /\cdot 60$$
$$5(22x-14) = 12(8x+7)$$
$$110x-70 = 96x+84 \qquad /-96x$$
$$14x-70 = 84 \qquad /+70$$
$$14x = 154 \qquad /:14$$
$$\underline{\underline{x = 11}}$$

13.

$$\begin{aligned} 0 &= \frac{2x-3}{14} - \frac{5x+17}{21} + \frac{73-14x}{2} && /\cdot 42 \\ 0 &= 3(2x-3) - 2(5x+17) + 21(73-14x) \\ 0 &= 6x - 9 - 10x - 34 + 1533 - 294x \\ 0 &= -298x + 1490 && /+298x \\ 298x &= 1490 && /:298 \\ \underline{\underline{x &= 5}} \end{aligned}$$

14.

$$\begin{aligned} \frac{5x-13}{6} - \frac{8x-10}{21} - \frac{87-x}{14} &= 1 && /\cdot 42 \\ 7(5x-13) - 2(8x-10) - 3(87-x) &= 42 \\ 35x - 91 - 16x + 20 - 261 + 3x &= 42 \\ 22x - 332 &= 42 && /+356 \\ 22x &= 374 && /:22 \\ \underline{\underline{x &= 17}} \end{aligned}$$

15.

$$\begin{aligned} \frac{3y+8}{5} - \frac{5y+12}{16} &= \frac{7y-4}{8} - \frac{9y-16}{20} && /\cdot 80 \\ 16(3y+8) - 5(5y+12) &= 10(7y-4) - 4(9y-16) \\ 48y + 128 - 25y - 60 &= 70y - 40 - 36y + 64 \\ 23y + 68 &= 34y + 24 && /-23y \\ 68 &= 11y + 24 && /-24 \\ 44 &= 11y && /:11 \\ \underline{\underline{4 &= y}} \end{aligned}$$

16.

$$\begin{aligned} \frac{10x+3}{9} + \frac{17x+1}{25} - \frac{14x-3}{15} + \frac{2-11x}{5} &= 5 && /\cdot 225 \\ 25(10x+3) + 9(17x+1) - 15(14x-3) + 45(2-11x) &= 1125 \\ 250x + 75 + 153x + 9 - 210x + 45 + 90 - 495x &= 1125 \\ -302x + 219 &= 1125 && /-219 \\ -302x &= 906 && /:(-302) \\ \underline{\underline{x &= -3}} \end{aligned}$$