

$$1. \quad a.) \quad 2(3z-2) + 304 = 5(2z-6) + 7z$$

$$6z - 4 + 304 = 10z - 30 + 7z$$

$$6z + 300 = 17z - 30$$

$$| -6z$$

$$300 = 11z - 30$$

$$| +30$$

$$330 = 11z$$

$$| :11$$

$$\underline{\underline{30 = z}}$$

$$b.) \quad 4(13z-19) - 74 = 7(120-5z) - 3z$$

$$52z - 76 - 74 = 840 - 35z - 3z$$

$$52z - 150 = 840 - 38z$$

$$| +38z$$

$$90z - 150 = 840$$

$$| +150$$

$$90z = 990$$

$$| :90$$

$$\underline{\underline{z = 11}}$$

$$c.) \quad 7(50-4x) + 61 = 6(82-6x) + 15$$

$$350 - 28x + 61 = 492 - 36x + 15$$

$$411 - 28x = 507 - 36x$$

$$| +36x$$

$$411 + 8x = 507$$

$$| -411$$

$$8x = 96$$

$$| :8$$

$$\underline{\underline{x = 12}}$$

$$\begin{aligned}
 \text{d.) } 2(28 - 3y) + 92 &= 3(5y + 1) - 2 \\
 56 - 6y + 92 &= 15y + 3 - 2 \\
 148 - 6y &= 15y + 1 && | +6y \\
 148 &= 21y + 1 && | -1 \\
 147 &= 21y && | :21 \\
 \underline{\underline{7}} &= \underline{\underline{y}}
 \end{aligned}$$

$$\begin{aligned}
 \text{e.) } 8(y - 6) + 9y &= 3(4y + 45) - 3 \\
 8y - 48 + 9y &= 12y + 135 - 3 \\
 17y - 48 &= 12y + 132 && | -12y \\
 5y - 48 &= 132 && | +48 \\
 5y &= 180 && | :5 \\
 \underline{\underline{y}} &= \underline{\underline{36}}
 \end{aligned}$$

$$\begin{aligned}
 \text{f.) } 5(72 - 3y) + 71 &= 4(63 + 4y) - 7 \\
 360 - 15y + 71 &= 252 + 16y - 7 \\
 431 - 15y &= 245 + 16y && | +15y \\
 431 &= 245 + 31y && | -245 \\
 186 &= 31y && | :31 \\
 \underline{\underline{6}} &= \underline{\underline{y}}
 \end{aligned}$$

$$\begin{aligned}
 g.) \quad 11(8x + 7) + 213 &= 4(200 - 3x) - 2x \\
 88x + 77 + 213 &= 800 - 12x - 2x \\
 88x + 290 &= 800 - 14x && | +14x \\
 102x + 290 &= 800 && | -290 \\
 102x &= 510 && | :102 \\
 \underline{\underline{x}} &= \underline{\underline{5}}
 \end{aligned}$$

$$\begin{aligned}
 h.) \quad 6(40 - 4x) - 3x &= 2(32 + 7x) + 135 \\
 240 - 24x - 3x &= 64 + 14x + 135 \\
 240 - 27x &= 199 + 14x && | +27x \\
 240 &= 41x + 199 && | -199 \\
 41 &= 41x && | :41 \\
 \underline{\underline{1}} &= \underline{\underline{x}}
 \end{aligned}$$

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$$\begin{aligned}
 \underline{2.} \quad a.) \quad 2x &= 3x && | -2x \\
 \underline{\underline{0}} &= \underline{\underline{x}}
 \end{aligned}$$

$$\begin{aligned}
 b.) \quad 2x - 5 &= 3x - 5 && | -2x \\
 -5 &= x - 5 && | +5 \\
 \underline{\underline{0}} &= \underline{\underline{x}}
 \end{aligned}$$

$$\begin{aligned}
 c.) \quad 2 - 5x &= 3x - 5 && | +5x \\
 2 &= 8x - 5 && | +5 \\
 7 &= 8x && | :8 \\
 \underline{\underline{\frac{7}{8}}} &= \underline{\underline{x}}
 \end{aligned}$$

$$\begin{aligned}
 d.) \quad & 3(2-6x) = 2(3-9x) \\
 & 6 - 18x = 6 - 18x \quad | +18x \\
 & \underline{6 = 6} \\
 & \Rightarrow \underline{\underline{L = G}} \quad (\text{Grundmenge})
 \end{aligned}$$

$$\begin{aligned}
 e.) \quad & 4(3x+7) = 5(6x+27) - (18x+107) \\
 & 12x + 28 = 30x + 135 - 18x - 107 \\
 & 12x + 28 = 12x + 28 \quad | -12x \\
 & \underline{28 = 28} \\
 & \Rightarrow \underline{\underline{L = G}}
 \end{aligned}$$

$$\begin{aligned}
 f.) \quad & 2(7y-5) + 3y = 43y - (26y-13) \\
 & 14y - 10 + 3y = 43y - 26y + 13 \\
 & 17y - 10 = 17y + 13 \quad | -17y \\
 & \underline{-10 = 13} \\
 & \Rightarrow \underline{\underline{L = \{\}} \quad (\text{Leere Menge})}
 \end{aligned}$$

$$\begin{aligned}
 g.) \quad & 14(11z+9) - 99z = 11(6z+5) - 11z \\
 & 154z + 126 - 99z = 66z + 55 - 11z \\
 & 55z + 126 = 55z + 55 \quad | -55z \\
 & \underline{126 = 55} \\
 & \Rightarrow \underline{\underline{L = \{\}}}
 \end{aligned}$$

$$\begin{aligned}
 h.) \quad 16(8x+7) - 25 &= 141x + 57 - (13x+9) \\
 128x + 112 - 25 &= 141x + 57 - 13x - 9 \\
 128x + 87 &= 128x + 48 && | -128x \\
 \underline{87} &= \underline{48} \\
 \Rightarrow \underline{x} &= \underline{\{ \}}
 \end{aligned}$$

$$\begin{aligned}
 \underline{3.} \quad a.) \quad 7x + 9 &= 73 - x && | +x \\
 8x + 9 &= 73 && | -9 \\
 8x &= 64 && | :8 \\
 \underline{x} &= \underline{8}
 \end{aligned}$$

$$\begin{aligned}
 b.) \quad 1'530 - 13z &= 1'946 - 117z && | +117z \\
 1'530 + 104z &= 1'946 && | -1'530 \\
 104z &= 416 && | :104 \\
 \underline{z} &= \underline{4}
 \end{aligned}$$

$$\begin{aligned}
 c.) \quad 623 + 9y &= (1'080 - 457) - 2y \\
 623 + 9y &= 1'080 - 457 - 2y \\
 623 + 9y &= 623 - 2y && | +2y \\
 623 + 11y &= 623 && | -623 \\
 11y &= 0 && | :11 \\
 \underline{y} &= \underline{0}
 \end{aligned}$$

$$\begin{aligned}
 \text{d.) } 820 - 143y &= 103y + 164 \cdot 5 \\
 820 - 143y &= 103y + 820 && | +143y \\
 820 &= 246y + 820 && | -820 \\
 0 &= 246y && | :246 \\
 \underline{\underline{0}} &= \underline{\underline{y}}
 \end{aligned}$$

$$\begin{aligned}
 \text{e.) } 9x - (4x - 3) &= x + 8 + 4x \\
 9x - 4x + 3 &= x + 8 + 4x \\
 5x + 3 &= 5x + 8 && | -5x \\
 3 &= 8 \\
 \Rightarrow \underline{\underline{L}} &= \underline{\underline{\{ \}} }
 \end{aligned}$$

$$\begin{aligned}
 \text{f.) } 51z + (179 + 73z) &= 1'307 + 3z - 39 \\
 51z + 179 + 73z &= 1'307 + 3z - 39 \\
 124z + 179 &= 1'268 + 3z && | -3z \\
 121z + 179 &= 1'268 && | -179 \\
 121z &= 1'089 && | :121 \\
 \underline{\underline{z}} &= \underline{\underline{9}}
 \end{aligned}$$

$$\begin{aligned}
 \text{g.) } 35 + (48y + 12) &= 12(5 + 4y) - 13 \\
 35 + 48y + 12 &= 60 + 48y - 13 \\
 48y + 47 &= 48y + 47 && | -48y \\
 47 &= 47 \\
 \Rightarrow \underline{\underline{L}} &= \underline{\underline{G}}
 \end{aligned}$$

$$\begin{aligned}
 h.) \quad 13t + 2 - 6t &= 27 + 19 + 5t \\
 7t + 2 &= 7t + 19 && | -7t \\
 2 &= 19 \\
 \hline
 \rightarrow t &= \underline{\underline{2}}
 \end{aligned}$$

$$\begin{aligned}
 4. \quad a.) \quad 5 - x &= 20 - 3(x + 3) \\
 5 - x &= 20 - 3x - 9 \\
 5 - x &= 11 - 3x && | +3x \\
 5 + 2x &= 11 && | -5 \\
 2x &= 6 && | :2 \\
 \underline{\underline{x}} &= \underline{\underline{3}}
 \end{aligned}$$

$$\begin{aligned}
 b.) \quad 4x - 7(1 - 2x) &= 8(x + 3) - 1 \\
 4x - 7 + 14x &= 8x + 24 - 1 \\
 18x - 7 &= 8x + 23 && | -8x \\
 10x - 7 &= 23 && | +7 \\
 10x &= 30 && | :10 \\
 \underline{\underline{x}} &= \underline{\underline{3}}
 \end{aligned}$$

$$\begin{aligned}
 c.) \quad (-1) - 2(x + 5) &= 17 - 6(x + 6) \\
 -1 - 2x - 10 &= 17 - 6x - 36 \\
 -11 - 2x &= -19 - 6x && | +6x \\
 -11 + 4x &= -19 && | +11 \\
 4x &= -8 && | :4 \\
 \underline{\underline{x}} &= \underline{\underline{-2}}
 \end{aligned}$$

$$\begin{aligned}
 \text{d.) } (-16) - 3(3x + 7) &= (-10) + 9(x - 3) \\
 -16 - 9x - 21 &= -10 + 9x - 27 \\
 -37 - 9x &= -37 + 9x && | +9x \\
 -37 &= -37 + 18x && | +37 \\
 0 &= 18x && | :18 \\
 \underline{\underline{0}} &= \underline{\underline{x}}
 \end{aligned}$$

$$\begin{aligned}
 \text{e.) } 4(3 - 4x) - 2x &= 5(x + 8) - 9x \\
 12 - 16x - 2x &= 5x + 40 - 9x \\
 12 - 18x &= -4x + 40 && | +18x \\
 12 &= 14x + 40 && | -40 \\
 -28 &= 14x && | :14 \\
 \underline{\underline{-2}} &= \underline{\underline{x}}
 \end{aligned}$$

$$\begin{aligned}
 \text{f.) } 15 + 3(4 - x) &= 32 - 7(x - 3) \\
 15 + 12 - 3x &= 32 - 7x + 21 \\
 27 - 3x &= 53 - 7x && | +7x \\
 27 + 4x &= 53 && | -27 \\
 4x &= 26 && | :4 \\
 \underline{\underline{x}} &= \frac{26}{4} = \frac{13}{2}
 \end{aligned}$$



$$\begin{aligned}
 \text{g.)} \quad & 3(15x - 2) - 5x = 6 - 4(3 - 2x) \\
 & 45x - 6 - 5x = 6 - 12 + 8x \\
 & 40x - 6 = -6 + 8x \quad | -8x \\
 & 32x - 6 = -6 \quad | +6 \\
 & 32x = 0 \quad | :32 \\
 & \underline{\underline{x = 0}}
 \end{aligned}$$

$$\begin{aligned}
 \text{h.)} \quad & (-25) - 7(x - 2) = (-2) - 2(x - 8) \\
 & -25 - 7x + 14 = -2 - 2x + 16 \\
 & -11 - 7x = 14 - 2x \quad | +7x \\
 & -11 = 5x + 14 \quad | -14 \\
 & -25 = 5x \quad | :5 \\
 & \underline{\underline{-5 = x}}
 \end{aligned}$$

$$\begin{aligned}
 \text{i.)} \quad & 21 - 5(6 - x) = 6 - 5(3 - x) \\
 & 21 - 30 + 5x = 6 - 15 + 5x \\
 & -9 + 5x = -9 + 5x \quad | -5x \\
 & \underline{\underline{-9 = -9}} \\
 & \Rightarrow \underline{\underline{L = 6}}
 \end{aligned}$$

$$\begin{aligned}
 \text{k.)} \quad & 16 - 5(5 - x) = 2x - 3(3 - x) \\
 & 16 - 25 + 5x = 2x - 9 + 3x \\
 & -9 + 5x = 5x - 9 \quad | -5x \\
 & \underline{\underline{-9 = -9}} \\
 & \Rightarrow \underline{\underline{L = 6}}
 \end{aligned}$$