Musterbeispiel

Aufgabe 22

a)

$2x - 7 = 3x - 2; \quad x \in \mathbb{N}$
$2x - 7 = 3x - 2 \qquad\qquad | + 2$
$2x - 5 = 3x \qquad\qquad | - 2x$
$\qquad x = -5$
$L = \{ \ \}, denn -5 \in \mathbb{Z}$

b)

$\frac{2}{3}y + 1 = \frac{1}{3}y + \frac{5}{3}; \quad x \in \mathbb{Q}_+$

$\frac{2}{3}y + 1 = \frac{1}{3}y + \frac{5}{3} \qquad\qquad | - 1$

$\frac{2}{3}y \qquad = \frac{1}{3}y + \frac{2}{3} \qquad\qquad | - \frac{1}{3}y$

$\frac{1}{3}y \qquad = \qquad \frac{2}{3} \qquad\qquad | \cdot 3$

$\qquad\qquad y = 2$

$L = \{2\}$

c)

$y^2 + 3y - y^2 = 0; \quad y \in \mathbb{N}$
$y^2 + 3y - y^2 = 0$
$\qquad 3y \qquad = 0 \qquad | : 3$
$\qquad y \qquad = 0$

$L = \{0\}$

d) $-2v - 3 = -9v - 3 + 7v \qquad | Zsf$
$\quad -2v - 3 = -2v - 3 \qquad\qquad | + 3$
$\quad -2v \qquad = -2v \qquad\qquad | + 2v$

$\quad 0 = 0$

$\quad L = \mathbb{Q}$

e) $3a - 5 + a = 1;$ $\quad a \in \mathbb{Q}_+$
   $3a - 5 + a = 1$ $\quad$ |Zsf.
   $4a - 5 \quad = 1$ $\quad$ |+5
   $4a \quad\quad = 6$ $\quad$ |:4
   $a \quad\quad\quad = \dfrac{3}{2}$

   $L = \left\{\dfrac{3}{2}\right\}$

f) $3x = -\dfrac{1}{3}x + \dfrac{10}{3}x + 1$ $\quad$ |Zsf.
   $3x = 3x + 1$ $\quad$ |-3x
   $0 = 1$

   $L = \emptyset$

g) $3x + 5 = 3 \cdot (x + 2)$ $\quad$ |Ausm.
   $3x + 5 = 3x + 6$ $\quad$ |-3x
   $\quad\quad 5 = 6$

   $L = \emptyset$

h) $3x + 3x + 4 = 6 \cdot \left(x + \dfrac{2}{3}\right)$ $\quad$ |Ausm. + Zsf.
   $6x \quad\quad + 4 = 6x + 4$ $\quad$ |-6x
   $\quad\quad 4 = \quad 4$

   $L = \mathbb{Q}$

i) $4x = 2(2x + 3)$ $\quad x \in \mathbb{Q}_+$
   $4x = 2(2x + 3)$ $\quad$ |Ausm.
   $4x = 4x + 6$ $\quad$ |-4x
   $0 = 6$

   $L = \emptyset$

j) $3x + 1 = 2x + 2;$ $\quad x \in \mathbb{N}$
   $3x + 1 = 2x + 2$ $\quad$ |-1
   $3x \quad = 2x + 1$ $\quad$ |-2x
   $x \quad = \quad 1$

   $L = \{1\}$