

Aufgabe 4

a)

$$\begin{aligned}3x - b &= 6 && | + b \\3x &= 6 + b && | : 3 \\x &= \frac{6 + b}{3}\end{aligned}$$

b)

$$\begin{aligned}\frac{1}{2}a + \frac{3}{2}x &= a && | - \frac{1}{2}a \\ \frac{3}{2}x &= \frac{1}{2}a && | : \frac{3}{2} \\ x &= \frac{1}{3}a\end{aligned}$$

c)

$$\begin{aligned}6b - x &= 3b + 2x && | + x \\6b &= 3b + 3x && | - 3b \\3b &= 3x && | : 3 \\b &= x\end{aligned}$$

d)

$$\begin{aligned}5 \cdot (x + a) &= x - a \\5x + 5a &= x - a && | - x \\4x + 5a &= -a && | - 5a \\4x &= -6a && | : 4 \\x &= -\frac{3}{2}a\end{aligned}$$

e)

$$\begin{array}{rcl}
 3x - b = a & & | + b \\
 3x = a + b & & | : 3 \\
 x = \frac{a + b}{3} & &
 \end{array}$$

f)

$$\begin{array}{rcl}
 \frac{1}{2}x - a + \frac{1}{4}b = 0 & & | + a \\
 \frac{1}{2}x + \frac{1}{4}b = a & & | - \frac{1}{4}b \\
 \frac{1}{2}x = a - \frac{1}{4}b & & | : \frac{1}{2} \\
 x = 2a - \frac{1}{2}b & &
 \end{array}$$

g)

$$\begin{array}{rcl}
 0,2x - 0,4a + b = 0 & & | - b \\
 0,2x - 0,4a = -b & & | + 0,4a \\
 0,2x = -b + 0,4a & & | : 0,2 \\
 x = -5b + 2a & &
 \end{array}$$

h)

$$\begin{array}{rcl}
 \frac{a + b}{2} = 2x + a & & | - a \\
 \frac{a + b}{2} - a = 2x & & | : 2 \\
 \frac{a + b}{4} - \frac{1}{2}a = x & &
 \end{array}$$

Aufgabe 5

a)

$$\begin{array}{l} a = b + c \qquad \qquad \qquad | - b \\ a - b = c \end{array}$$

$$\begin{array}{l} a = b + c \qquad \qquad \qquad | - c \\ a - c = b \end{array}$$

b)

$$\begin{array}{l} 3a - 15 = 5b \qquad \qquad \qquad | + 15 \\ 3a = 5b + 15 \qquad \qquad \qquad | : 3 \\ a = \frac{5}{3}b + 5 \end{array}$$

$$\begin{array}{l} 3a - 15 = 5b \qquad \qquad \qquad | : 5 \\ \frac{3}{5}a - 3 = b \end{array}$$

c)

$$\begin{array}{l} a = 2b + 3c \qquad \qquad \qquad | - 2b \\ a - 2b = 3c \qquad \qquad \qquad | : 3 \\ \frac{a - 2b}{3} = c \end{array}$$

$$\begin{array}{l} a = 2b + 3c \qquad \qquad \qquad | - 3c \\ a - 3c = 2b \qquad \qquad \qquad | : 2 \\ \frac{a - 3c}{2} = b \end{array}$$

d)

$$\begin{array}{rcl}
 b & = & a - (2b - 1) \\
 b & = & a - 2b + 1 & | + 2b \\
 3b & = & a + 1 & | - 1 \\
 3b - 1 & = & a
 \end{array}$$

$$\begin{array}{rcl}
 b & = & a - (2b - 1) \\
 b & = & a - 2b + 1 & | + 2b \\
 3b & = & a + 1 & | : 3 \\
 b & = & \frac{a + 1}{3}
 \end{array}$$

e) Wir werden durch b und c dividieren, deswegen dürfen sie nicht gleich Null sein!

$$b \neq 0 \quad c \neq 0$$

$$\begin{array}{rcl}
 a & = & b \cdot c & | : c \\
 \frac{a}{c} & = & b
 \end{array}$$

$$\begin{array}{rcl}
 a & = & b \cdot c & | : b \\
 \frac{a}{b} & = & c
 \end{array}$$

f) Wir werden durch a dividieren, deswegen darf dieser Wert nicht gleich Null sein. Außerdem dividieren wir durch $(b + 2)$ und deswegen darf b nicht gleich -2 sein (sonst dividieren wir durch $-2 + 2$ also durch Null).

$$\begin{aligned} ab + 2a &= 1 \\ a \cdot (b + 2) &= 1 && | : (b + 2) \\ a &= \frac{1}{b + 2} \end{aligned}$$

$$\begin{aligned} ab + 2a &= 1 && | - 2a \\ ab &= 1 - 2a && | : a \\ b &= \frac{1 - 2a}{a} \end{aligned}$$