Mathematik Klasse 7b **Thema: Variablen und Terme**

Einheit: Rechnen mit Variablen; Addition und Subtraktion

Übungsblatt 3 **Datum**: 13.03.2020

Lösung

Aufgabe 1:

a) $(-3+1-5+7)x = 0$ b) $(4-2-1+3-7+1)x = -2x$ c) $(-2-5)x = -7x$ d) $(-1+5-1+1)x = 4x$

e) $\left(\frac{1}{2}-\frac{1}{2}\right)y = 0$ f) $\left(\frac{2}{3}+\frac{1}{3}\right)a = \frac{3}{3}a = a$ g) $\left(-\frac{2}{5}-\frac{1}{5}\right)k = -\frac{3}{5}k$ h) $\left(-\frac{2}{3}-\frac{1}{5}\right)z = -\frac{13}{15}x$ i) $\left(\frac{1}{6}-\frac{1}{3}\right)r = -\frac{1}{6}r$

j) $-m-7m+2m+5-3+4 = (-1-7+2)m+5-3+4 = -6m+6$

k) $-2l-5-l-8l-4 = -2l-l-8l-5-4 = (-2-1-8)l-5-4 = -11l-9$

l) $-3-s-3s-7+s-5-2s-4s = -3-7-5-s-3s+s-2s-4s = -15-9s$

3)		$-7x$	$-\frac{3}{5}k$	$-\frac{1}{6}r$	$-6m+6$	$-11l-9$	$-15-9s$
Natürliche Zahl	3	$-7\cdot 3 = -21$	$-\frac{3}{5}\cdot 3 = -\frac{9}{5}$	$-\frac{1}{6}\cdot 3 = -\frac{1}{2}$	$-6\cdot 3+6$ $= -12$	$-11\cdot 3-9$ $= -42$	$-15-9\cdot 3$ $= -42$
Negative Zahl	-2	$-7\cdot(-2)$ $= 14$	$-\frac{3}{5}\cdot(-2) = \frac{6}{5}$	$-\frac{1}{6}\cdot(-2) = \frac{1}{3}$	$-6\cdot(-2)+6$ $= 18$	$-11\cdot(-2)-9$ $= 13$	$-15-9\cdot(-2)$ $= 3$
Bruchzahl	$\frac{1}{3}$	$-7\cdot\frac{1}{3} = -\frac{7}{3}$	$-\frac{3}{5}\cdot\frac{1}{3} = -\frac{1}{5}$	$-\frac{1}{6}\cdot\frac{1}{3} = -\frac{1}{18}$	$-6\cdot\frac{1}{3}+6$ $= -2+6 = 4$	$-11\cdot\frac{1}{3}-9$ $= -\frac{11}{3}-\frac{27}{3}$ $= -\frac{38}{3}$	$-15-9\cdot\frac{1}{3}$ $= -15-3$ $= -18$

Aufgabe 2: Zerlege den Term wie im Beispiel.

a) $-2m+3m = -m-m+m+m+m$ b) $-5r-2r = -r-r-r-r-r-r-r$

c) $2r-4r = r+r-r-r-r-r$ d) $-4n-2n = -n-n-n-n-n-n$

e) $-2x+3x = -x-x+x+x+x$

Aufgabe 3: Löse die Klammer auf.

a) $(-2-5-1)x = -2x-5x-x$ b) $\left(-\frac{1}{3}-\frac{2}{3}\right)y+4 = -\frac{1}{3}y-\frac{2}{3}y+4$ c) $(-1-2)m = -m-2m$

d) $(-1-5)y-3 = -y-5y-3$ e) $-8+(3-7)z = -8+3z-7z$ f) $7+k(2-5) = 7+2k-5k$

g) $2+z(-7-5) = 2-7z-5z$ h) $z(-8+5) = -8z+5z$

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Aufgabe 4:

a) $\frac{1}{2}y - \frac{1}{3}y + 2y = \left(\frac{1}{2} - \frac{1}{3} + 2\right)y = \left(\frac{3-2}{6} + 2\right)y = \left(\frac{1}{6} + \frac{12}{6}\right)y = \frac{13}{6}y$

b) $\frac{2}{3}a + \frac{1}{5}a - 2a = \left(\frac{2}{3} + \frac{1}{5} - 2\right)a = \left(\frac{10+3}{15} - 2\right)a = \left(\frac{13}{15} - \frac{30}{15}\right)a = -\frac{17}{15}x$

c) $5 - \frac{2}{5}k - \frac{1}{5}k = 5 + \left(-\frac{2}{5} - \frac{1}{5}\right)k = 5 - \frac{3}{5}k$

d) $6 - \frac{2}{3}z - \frac{1}{5}z = 6 + \left(-\frac{2}{3} - \frac{1}{5}\right)z = 6 + \left(\frac{-10-3}{15}\right)z = 6 - \frac{13}{15}z$

e) $3 + \frac{1}{6}r - \frac{1}{3}r = 3 + \left(\frac{1}{6} - \frac{1}{3}\right)r = 3 + \left(\frac{1}{6} - \frac{2}{6}\right)r = 3 - \frac{1}{6}r$

		$\frac{13}{6}y$	$-\frac{17}{15}x$	$5 - \frac{3}{5}k$	$6 - \frac{13}{15}z$	$3 - \frac{1}{6}r$
Natürliche Zahl	5	$\frac{13}{6} \cdot 5 = \frac{65}{6}$	$-\frac{17}{15} \cdot 5 = -\frac{17}{3}$	$5 - \frac{3}{5} \cdot 5 = 5 - 3 = 2$	$6 - \frac{13}{15} \cdot 5 = \frac{18}{3} - \frac{13}{3} = \frac{5}{3}$	$3 - \frac{1}{6} \cdot 5 = \frac{18}{6} - \frac{5}{6} = \frac{13}{6}$
Negative Zahl	-3	$\frac{13}{6} \cdot (-3) = -\frac{13}{2}$	$-\frac{17}{15} \cdot (-3) = \frac{17}{5}$	$5 - \frac{3}{5} \cdot (-3) = \frac{25}{5} + \frac{9}{5} = \frac{34}{5}$	$6 - \frac{13}{15} \cdot (-3) = \frac{30}{5} + \frac{13}{5} = \frac{43}{5}$	$3 - \frac{1}{6} \cdot (-3) = 3 + \frac{3}{6} = \frac{6}{2} + \frac{1}{2} = \frac{7}{2}$
Bruchzahl	$\frac{3}{5}$	$\frac{13}{6} \cdot \frac{3}{5} = \frac{13}{10}$	$-\frac{17}{15} \cdot \frac{3}{5} = -\frac{17}{25}$	$5 - \frac{3}{5} \cdot \frac{3}{5} = \frac{125}{25} - \frac{9}{25} = \frac{116}{25}$	$6 - \frac{13}{15} \cdot \frac{3}{5} = 6 - \frac{13}{25} = \frac{150-13}{25} = \frac{137}{25}$	$3 - \frac{1}{6} \cdot \frac{3}{5} = \frac{30}{10} - \frac{1}{10} = \frac{29}{10}$