

Aufgabe 1 (8P)

$$\begin{aligned} a) \quad 3 + 5 \cdot (x - 4) &= 6 \cdot (2x - 1) \\ 8 \cdot (x - 4) &= 12x - 1 \end{aligned}$$

$$\begin{aligned} b) \quad 2x + 4 &= 14 && |:2 \\ x + 4 &= 7 \end{aligned}$$

$$\begin{aligned} c) \quad 8x - 32 &= 12x - 1 && |+1 - 8x \\ -33 &= 4x \end{aligned}$$

$$\begin{aligned} d) \quad 4 - (3x - 2 + 4x) &= (8x - 10):2 \\ 4 - 3x + 2 + 4x &= 8x - 5 \end{aligned}$$

$$\begin{aligned} e) \quad 3 \cdot (4 - x) &= 15 && |:3 \\ 4 - x &= 5 \end{aligned}$$

$$\begin{aligned} f) \quad 6 - x &= 8x - 5 && |+x + 5 \\ 11 &= 9x \end{aligned}$$

a)	$3 + 5 \cdot (x - 4) = 6 \cdot (2x - 1)$	
2f	$8 \cdot (x - 4) = 12x - 1$	
b)	$2x + 4 = 14$:2
1f	$x + 4 = 7$	
c)	$8x - 32 = 12x - 1$	+1 - 8x
1f	$-33 = 4x$	
d)	$4 - (3x - 2 + 4x) = (8x - 10):2$	
2f	$4 - 3x + 2 + 4x = 8x - 5$	
e)	$3 \cdot (4 - x) = 15$:3
0f	$4 - x = 5$	
f)	$6 - x = 8x - 5$	+x + 5
0f	$11 = 9x$	

Aufgabe 2 (8P)

a)

LM, LA, LJ, LP

MA, MJ, MP

AJ, AP JP

→ 4+3+2+1 = 10 mal

b)

J	L	M	A	P
J	L	A	M	P
J	M	L	A	P
J	M	A	L	P
J	A	M	L	P
J	A	L	M	P

P	L	M	A	J
P	L	A	M	J
P	M	L	A	J
P	M	A	L	J
P	A	M	L	J
P	A	L	M	J

→ 12 Möglichkeiten

Aufgabe 3 (9P)

a)

i. $25e - 3 \cdot (8e - 7)$

$$25e - 3 \cdot (8e - 7) = 25e - 24e + 21 = e + 21$$

ii. $ab \cdot (ab - 5ba)$

$$ab \cdot (ab - 5ba) = abab - ab5ba = a^2b^2 - 5a^2b^2 = -4a^2b^2$$

iii. $63pq : (-21q)$

$$63pq : (-21q) = \frac{63}{-21} \cdot \frac{pq}{q} = -3p$$

b)

$$\frac{3}{8} - \frac{7}{8} \cdot (5 - \sqrt{36})^2 \quad \frac{3}{8} - \frac{7}{8} \cdot (5 - \sqrt{36})^2 = \frac{3}{8} - \frac{7}{8} \cdot (5 - 6)^2 = \frac{3}{8} - \frac{7}{8} \cdot (-1)^2 = \frac{3}{8} - \frac{7}{8} \cdot 1 = -\frac{4}{8} = -\frac{1}{2}$$

Aufgabe 4 (25P)

(a)

Kantenlänge $a = 3$

$$I \quad V = 3 \cdot 3 \cdot \frac{3}{2} \cdot \frac{1}{2} = \frac{27}{4}$$

$$II \quad U = 2 \cdot 3 + 2 \cdot \sqrt{9 + \frac{9}{4}} = 6 + 3\sqrt{5}$$

(b)

$$2 \cdot 2a + a \cdot 16a + 2a \cdot (4a + 1) = 24a^2 + 6a = 6a \cdot (4a + 1)$$

Feld III

(c)

$$3b \cdot (3a + 6) + b \cdot x + 3b \cdot (a - 6) = 20ab$$

$$9ab + 18b + bx + 3ab - 18b = 20ab$$

$$bx = 8ab$$

$$x = 8a$$

(d)

$$I \quad 180^\circ = 2\alpha + (90^\circ - \beta) \Leftrightarrow \beta = 2\alpha - 90^\circ$$

$$II \quad 180^\circ = \alpha + 2\beta \Leftrightarrow \alpha = 180^\circ - 2\beta$$

$$II \quad \alpha = 180^\circ - 2(2\alpha - 90^\circ) \Leftrightarrow \alpha = 72^\circ \quad \text{aus I folgt:} \quad \beta = 54^\circ$$

$$III \quad 180^\circ = 2\gamma + (90^\circ - \alpha) \Leftrightarrow \gamma = 81^\circ$$