S 18

1) $M = \{ x \in \mathbb{N} \mid x \bmod 7 \neq 0 \}$

2) $M = \{ x \in \mathbb{Z}^{>-10} \mid x \bmod 4 = 0 \vee x \bmod 5 = 0 \}$
$x \in]-10; \infty[_{\mathbb{Z}}$

3) $M = \{ x \in \mathbb{N}^{\leq 100} \mid x \bmod 15 = 0 \}$

$\{ x \in \mathbb{Z} \mid (x > 0 \wedge x < 100) \wedge (x \bmod 3 = 0 \wedge x \bmod 5 = 0) \}$

4) $M = \{ x \in]4; 42[_{\mathbb{N}} \mid x \bmod 2 = 0 \wedge x \bmod 3 \neq 0 \}$

5) $M = \{ x \in [-10; 42]_{\mathbb{Z}} \mid x \bmod 7 \neq 0 \wedge x \bmod 3 = 0 \}$

$\{ x \in \mathbb{Z} \mid x > -10 \ldots \}$; $\{ x \in \mathbb{Z}_{>-10} \mid \ldots$
$x \in (\mathbb{Z}_{>-10}) \mid$

S 22 Nr. 1: $\mathbb{L} = \{c; e; g; h; i\}$

Nr. 2: $A \cap B = \{x \in [-10; 10]_{\mathbb{Z}} \mid x \bmod 5 = 0\}$

$A \cup B = \{x \in \mathbb{Z} \mid x \bmod 5 = 0 \vee x \in]-10; 10[\}$

$A \setminus B = \{x \in \mathbb{Z} \setminus \{\pm 10; \pm 5; 0\} \mid x \bmod 5 = 0\}$

$B \setminus A = \{x \in]-10; 10[_{\mathbb{Z}} \mid x \bmod 5 \neq 0\}$

$f(x) = \frac{1}{x-3}$; $\mathbb{D} = x \in \mathbb{R} \setminus \{3\}$

$\overline{50-8} = \overline{42}$

$\overline{50} + \overline{8}$

$60 + (-18) = 42$

S 26 3)

$$\overline{\overline{A \cup B} \cup \overline{A \cup \overline{B}}}$$

de Morgan

$$\overline{\overline{A \cup B}} \cap \overline{\overline{A \cup \overline{B}}}$$

doppelte Negation

3. x + 3. x̄

$$(A \cup B) \cap (A \cup \overline{B})$$

Distributiv

3. (x + x̄)

$$A \cup (B \cap \overline{B})$$

Komplement

$$A \cup \{\}$$

neutrales Objekt

$$A$$

Gleichzeitig

$$B \cap \overline{B} \hat{=} (x > 5) \wedge (x \leq 5)$$

S 34 Nr. 35) $\frac{1}{2} \cdot \left(\frac{4}{3} + \frac{4}{5} \right) - \frac{2}{3} \cdot \left(\frac{3}{4} - \frac{1}{6} \right)$

$\frac{1}{2} \cdot \frac{20+12}{15} - \frac{2}{3} \cdot \frac{9-2}{12}$

$\frac{1}{2} \cdot \frac{32^{16}}{15} - \frac{2}{3} \cdot \frac{7}{12_6} = \frac{16}{15} - \frac{7}{18} = \frac{96-35}{90} = \frac{61}{90}$

$3 \cdot 5 \qquad 3 \cdot 3 \cdot 2$

$\frac{123}{99}$

$\frac{99}{99} + \frac{24}{99}$

$1,\overline{24}$

45) $\frac{\frac{2}{5} + \frac{4}{3}}{\frac{4}{5} - \frac{10}{13}} = \frac{\frac{6+20}{15}}{\frac{52-50}{65}} = \frac{\frac{26}{15}}{\frac{2}{65}}$

$= \frac{26}{15} \cdot \frac{65}{2} = \frac{169}{3} = 56\frac{1}{3}$

$= 56,\overline{3}$

$0,0\overline{13}$

$\downarrow$

$\frac{1}{10} \cdot 0,\overline{13}$

$\frac{1}{10} \cdot \frac{13}{99} = \frac{13}{990}$

$0,0\overline{6}$

$\frac{1}{10} \cdot 0,\overline{6} = \frac{1}{10} \cdot \frac{6}{9} = \frac{6}{90}$

S. 36 Kn. 4) $42 - [(\frac{z}{y} + 2x - z)(z - 2x + \frac{z}{y})]$

$42 - [\frac{2z}{y} - \frac{4x}{y} + \frac{4}{y^2} + 2xz - 4x^2 + \frac{4x}{y} - \frac{2z}{y} + 2xz - z^2]$

$42 - [4xz + \frac{4}{y^2} - 4x^2 - z^2] = 42 - 4xz - \frac{4}{y^2} + 4x^2 + z^2$

Kn. 5) $-a + (3 - 16 + 5 - (c - 2 + (a - 5)))) - (c - 4)$

$-a + (3 - (5 + 5 - c + 2 - a - 5)) - c + 4$ → 7

$-a + 3 - 7 + c + a - c + 4$

0

$$\frac{3x}{\sqrt{2x}-4} \cdot \frac{\sqrt{2x}+4}{\sqrt{2x}+4} = \frac{3x\sqrt{2x}+12x}{2x-16}$$

$a \quad -b \qquad a+b \qquad\qquad a^2 - b^2$

$$(\sqrt{2x}-4)^2 = 2x - 8\cdot\sqrt{2x} + 16$$

$$(2x - 1/2)^4$$

$$(2x-1/2)^2(2x-1/2)^1$$

n
0	1
1	1 1
2	1 2 1
3	1 3 3 1
4	1 4 6 4 1
5	1 5 10 10 5 1

$$1(2x)^4(-1/2)^0 + 4(2x)^3(-1/2)^1 + 6(2x)^2(-1/2)^2 + 4(2x)^1(-1/2)^3 + 1(2x)^0(-1/2)^4$$

$$16x^4 - 16x^3 + 6x^2 - x + 1/16$$

1) $\dfrac{3-\sqrt{x}}{2\sqrt{x}-1}$

$\hookrightarrow \dfrac{3-\sqrt{x}}{2\sqrt{x}-1} \cdot \dfrac{2\sqrt{x}+1}{2\sqrt{x}+1} = \dfrac{(3-\sqrt{x})\cdot(2\sqrt{x}+1)}{(2\sqrt{x})^2 - 1^2}$

$a \quad -5 \qquad a \quad +5 \qquad a^2 \quad - \quad 5^2$

$\dfrac{6\sqrt{x}+3-2x-\sqrt{x}}{4x-1} = \dfrac{5\sqrt{x}+3-2x}{4x-1}$

2) $(\frac{1}{2}x-2)^5$

$1\left(\frac{1}{2}x\right)^5(-2)^0 + 5\left(\frac{1}{2}x\right)^4(-2)^1 + 10\left(\frac{1}{2}x\right)^3(-2)^2 + 10\left(\frac{1}{2}x\right)^2(-2)^3 + 5\left(\frac{1}{2}x\right)^1(-2)^4 + 1\left(\frac{1}{2}x\right)^0(-2)^5$

$\frac{1}{32}x^5 - \frac{5}{8}x^4 + 5x^3 - 20x^2 + 40x - 32$