

S. 80

Nr. 2

 $T_1 \leftrightarrow T_2$?

a	w	w	w	w	f	f	f	f
b	w	w	f	f	w	w	f	f
c	w	f	w	f	w	f	w	f
T_1								
$a \wedge b$	w	w	f	f	f	f	f	f
$a \wedge b \rightarrow c$	w	f	w	w	w	w	w	w
T_2								
$a \rightarrow c$	w	f	w	f	w	w	w	w
$b \rightarrow c$	w	f	w	w	w	f	w	w
$(1) \vee (1)$	w	f	w	w	w	w	w	w
$T_1 \leftrightarrow T_2$	w	w	w	w	w	w	w	w

$E[A] = \text{Bool}^3 \rightarrow \text{Tautologie} \rightarrow \underbrace{T_1 \leftrightarrow T_2}$
sind äquivalent

$$1) \quad 3a \cdot (b-4) - 2b \cdot (2+a)$$

$$3ab - 12a - 4b - 2ab - 1ab - 12a - 4b$$

$$2) \quad (3x-2) \cdot (1/2y+3) = 3/2xy + 9x - y - 6$$

$$3) \quad 2x^2 - x = x(2x - 1)$$

Binomische Formel: $(a \pm b)^2 = a^2 \pm 2ab + b^2$

$$(a-b)(a+b) = a^2 - b^2$$

$$\begin{aligned} (1/2x - 3y)^2 &= (1/2x)^2 - 2 \cdot (1/2x) \cdot 3y + (3y)^2 \\ &= 1/4x^2 - 3xy + 9y^2 \end{aligned}$$

S 82

$$\begin{aligned}
 & 1) \quad (b + a - (c - 3 - d + 5 - (a + c + (b - d)))) \\
 & \quad b + a - (c - 3 - d + 5 - a - c - 5 + d) \\
 & \quad b + a + a + 3 = 3 + 2a + 5
 \end{aligned}$$

$$\begin{aligned}
 & 2) \quad (6 - 13x + y - 1/2z)(1/2z - 3x + y) \\
 & \quad 6 - (3xz - 9x^2 + 3xy + 1/2z - 3xy + y^2 - 1/4z^2 + 3/2xz - 1/2yz) \\
 & \quad 6 - 3xz + 9x^2 - y^2 + 1/4z^2
 \end{aligned}$$

$$\begin{aligned}
 & 3) \quad x - (2 + (3 - y + z - (2 + x - (y - z)))) \\
 & \quad x - (2 + 3 - y + z - 2 - x + y - z) \\
 & \quad x - (3 - x) = 2x - 3
 \end{aligned}$$

$$\begin{aligned}
 & 4) \quad 4z - \left(\frac{2}{y} + 2x - z\right)\left(z - 2x + \frac{2}{y}\right) \\
 & \quad 4z - \left(\frac{2z}{y} - \frac{4x}{y} + \frac{4}{y^2} + 2xz - 4x^2 + \frac{4x}{y} - z^2 + 2xz - \frac{2z^2}{y}\right) \\
 & \quad 4z - (4xz + 4/y^2 - 4x^2 - z^2) \\
 & \quad 4z - 4xz - 4/y^2 + 4x^2 + z^2
 \end{aligned}$$

S 85

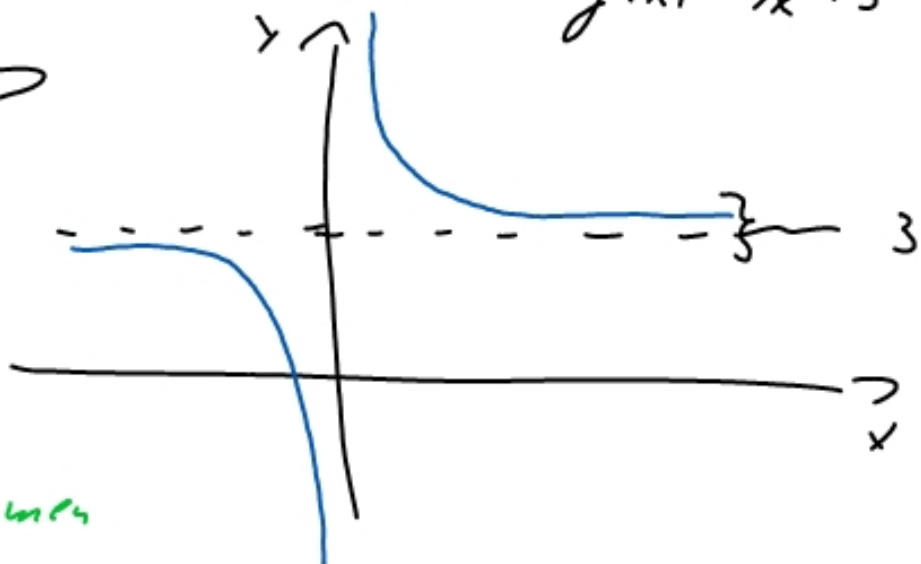
$$\begin{aligned} 1) & (2y + \frac{1}{2}x)(x - 4y) - 8 \cdot (\frac{1}{4}x + y)^2 \\ & \frac{1}{2} \cdot (x + 4y)(x - 4y) - 8 \cdot (\frac{1}{16}x^2 + \frac{1}{2}xy + y^2) \\ & \frac{1}{2} \cdot (x^2 - 16y^2) - \frac{1}{2}x^2 - 4xy - 8y^2 \\ & \frac{1}{2}x^2 - 8y^2 - \frac{1}{2}x^2 - 4xy - 8y^2 = -4xy - 16y^2 = -4y(x + 4y) \end{aligned}$$

$$\begin{aligned} 2) & (2s - 3a)(3a - 2s) - (2a - s)^2 \\ & - (3a - 2s) \cdot (3a - 2s) - (4a^2 - 4as + s^2) \\ & - (9a^2 - 12as + 4s^2) - (4a^2 - 4as - s^2) \\ & - 9a^2 + 12as - 4s^2 - 4a^2 + 4as - s^2 = -13a^2 + 16as - 5s^2 \end{aligned}$$

$$\begin{aligned} 3) & \frac{5 - 2\sqrt{x}}{3 + \sqrt{2x}} \cdot \frac{3 - \sqrt{2x}}{3 - \sqrt{2x}} = \frac{(5 - 2\sqrt{x}) \cdot (3 - \sqrt{2x})}{9 - 2x} \\ & \quad \quad \quad (a + b) \quad \quad (a - b) \quad \quad \quad a^2 - b^2 \end{aligned}$$

Limes

$$f(x) = \frac{1}{x} + 3$$



$$\lim_{x \rightarrow 2} \frac{3x-6}{\sqrt{2x}-2} = \frac{0}{0}$$



$(x-2)$ Linearfaktor
muss vollkommen

$$\lim_{x \rightarrow 2} \frac{3(x-2)}{\sqrt{2x}-2} \cdot \frac{\sqrt{2x}+2}{\sqrt{2x}+2}$$

$$\begin{array}{c} \downarrow \quad \downarrow \\ 2x-4 \\ 2 \cdot (x-2) \end{array}$$

$$\lim_{x \rightarrow 2} \frac{3 \cdot \overbrace{(x-2)} \cdot (\sqrt{2x}+2)}{2 \cdot \overbrace{(x-2)}} = \frac{12}{2} = 6$$

beliebiger
Lücke
bei (2|6)

$$\begin{aligned} x^2 - 5x + 6 &= 0 \\ (x-3) \cdot (x-2) &= 0 \\ x_1=3 \vee x_2=2 \end{aligned}$$

$$(a + b)^n$$

$$(\underline{1} \underline{-2})^4$$

$$(\underline{2x} + \underline{y})^5$$

									5
									0
									1
									2
									3
									4
									5

Pascal's triangle for $(a+b)^n$ with $n=5$. The binomial coefficients are arranged in rows corresponding to powers of a from 5 down to 0. The coefficients are: Row 5: 1, 5, 10, 10, 5, 1; Row 4: 1, 4, 6, 4, 1; Row 3: 1, 3, 3, 1; Row 2: 1, 2, 1; Row 1: 1, 1; Row 0: 1. Green arrows point to the coefficients 1, 2, 3, 4, 5, 10, 10, 5, 1 in the bottom row, which are used in the expansion of $(2x+y)^5$.

$$1(2x)^5 y^0 + 5(2x)^4 y^1 + 10(2x)^3 y^2 + 10(2x)^2 y^3 + 5(2x)^1 y^4 + 1(2x)^0 y^5$$

$$32x^5 + 80x^4y + 80x^3y^2 + 40x^2y^3 + 10xy^4 + y^5$$

$$1 \cdot 1^4 (-2i)^0 + 4 \cdot 1^3 (-2i)^1 + 6 \cdot 1^2 (-2i)^2 + 4 \cdot 1^1 (-2i)^3 + 1 \cdot 1^0 (-2i)^4$$
$$1 - 8i + 24i^2 - 32i^3 + 16i^4$$

$$1 - 8i - 24 + 32i + 16 = -7 + 24i$$

