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
$() \vee ()$	W	F	W	W	W	W	W	W
$T_1 \leftrightarrow T_2$	W	W	W	W	W	W	W	W

$E[A] = Bool^3$ -> Tautologie -> $T_1 \Leftrightarrow T_2$

sind äquivalent

I $f(x) = 2x + 4$ $g(x) = 2 \cdot (x+2)$

$g(x) = f(x) \Rightarrow 2x+4 = 2 \cdot (x+2) = 2x+4$

$0 = 0 \rightarrow$ Tautologie

$x \in \mathbb{R}$

II $f(x) = 2x+4$ $g(x) = \frac{4}{2} x - 3$

$2x+4 = 2x - 3$ Kontradiktion

$7 = 0$ $\{\}$

1) $3 \cdot (x-2) - 4(x+5) = 3x - 6 - 4x - 20 = -x - 26$

2) $(x-3)(x+5) = x^2 - 3x + 5x - 15 = x^2 + 2x - 15$

$2xy - x + 3x^2 = x \cdot (2y - 1 + 3x)$

S 82

1) $(6 + a - (c - 3 - d + 5 - (a + c + (6 - d))))$

$6 + a - (c - 3 - d + 5 - a - c - 5 + d)$

$6 + a + a + 3 = 3 + 2a + 5$

2) $16 - (3x + y - \frac{1}{2}z)(\frac{1}{2}z - 3x + y)$

$16 - (\frac{3}{2}xz - 9x^2 + 3xy + \frac{1}{2}yz - 3xy + y^2 - \frac{1}{4}z^2 + \frac{3}{2}xz - \frac{1}{2}yz)$

$16 - 3xz + 9x^2 - y^2 + \frac{1}{4}z^2$

3) $x - (2 + (3 - y + z - (2 + x - (y - z))))$

$x - (2 + 3 - y + z - 2 - x + y - z)$

$x - (3 - x) = 2x - 3$

4) $42 - (\frac{z}{y} + 2x - z)(z - 2x + \frac{2}{y})$

$42 - (\frac{2z}{y} - \frac{4x}{y} + \frac{4}{y^2} + 2xz - 4x^2 + \frac{4x}{y} - z^2 + 2xz - \frac{2z}{y})$

$42 - (4xz + 4/y^2 - 4x^2 - z^2)$

$42 - 4xz - 4/y^2 + 4x^2 + z^2$

1./2. Binom $(a \pm b)^2 = a^2 \pm 2ab + b^2$

$$\left(\tfrac{1}{2}x - 3y\right)^2 = \left(\tfrac{1}{2}x\right)^2 - 2\cdot\left(\tfrac{1}{2}x\right)\cdot(3y) + (3y)^2$$
$$= \tfrac{1}{4}x^2 - 3xy + 9y^2$$

$$\frac{2\sqrt{x}-3}{4+\sqrt{x}} \qquad x \in \mathbb{Q}$$

Machen Sie den Nenner rational

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

$$27 \cdot 33 = (30-3)(30+3) = 30^2 - 3^2 = 900 - 9 = 891$$

$$42^2 = (40+2)^2 = 40^2 + 2\cdot 40 \cdot 2 + 4$$

S 85

1) $(2y + \frac{1}{2}x)(x-4y) - 8\cdot(\frac{1}{4}x+y)^2$

$\frac{1}{2}\cdot(x+4y)(x-4y) - 8\cdot(\frac{1}{4}x+y)^2$

$\frac{1}{2}\cdot(x^2 - 16y^2) - 8\cdot(\frac{1}{16}x^2 + \frac{1}{2}xy + y^2)$

$\frac{1}{2}x^2 - 8y^2 - \frac{1}{2}x^2 - 4xy - 8y^2 = -16y^2 - 4xy = -4y(4y+x)$

2) $(2b-3a)(3a-2b) - (2a-b)^2$

$-(3a-2b)(3a-2b) - (2a-b)^2$

$-(9a^2 - 12ab + 4b^2) - (4a^2 - 4ab + b^2)$

$-13a^2 + 16ab - 5b^2$

3) $\frac{5-2\sqrt{x}}{3+\sqrt{2x}} \cdot \frac{3-\sqrt{2x}}{3-\sqrt{2x}} = \frac{(5-2\sqrt{x})\cdot(3-\sqrt{2x})}{9-2x}$

$(a+b)^n$

Pascal'sche Δ

Koeffizienten-stellen

$(2x - 1/2)^5$

$(\ )^5 = (\ )^2 \cdot (\ )^2 \cdot (\ )^1$

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

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
6	1 6 15 20 15 6 1

$1(2x)^5(-\tfrac12)^0 + 5(2x)^4(-\tfrac12)^1 + 10(2x)^3(-\tfrac12)^2 + 10(2x)^2(-\tfrac12)^3 + 5(2x)^1(-\tfrac12)^4 + 1(2x)^0(-\tfrac12)^5$

$32x^5 - 40x^4 + 20x^3 - 5x^2 + 5/8 \cdot x - 1/32$

$1(\tfrac12)^4(-2i)^0 + 4(\tfrac12)^3(-2i)^1 + 6(\tfrac12)^2(-2i)^2 + 4(\tfrac12)^1(-2i)^3 + 1(\tfrac12)^0(-2i)^4$

$1/16 - i + 6i^2 - 16i^3 + 16i^4 = 10\tfrac{1}{16} + 15i$

$i^2 = (-1)$, $i^3 = (-i)$, $i^4 = 1$