

3. Bez

Muster / Terme

Lösungen AB 6

1

x	1	2	3	4	5	6	7	8
T_x	1	8	27	64	125	216	343	512
		+7	+19	+37	+62	+91	+127	+169
			+12	+18	+24	+30	+36	+42
				+6	+6	+6	+6	+6
x^3	1	8	27	64	125	216	343	512
es fehlt:	0	0	0	0	0	0	0	0

--> x^3

es fehlt: 0 0 0 0 0 0 0 0 --> x^3

2

x	1	2	3	4	5	6	7	8
T_x	3	11	31	69	131	223	351	521
		+8	+20	+38	+62	+92	+128	+170
			+12	+18	+24	+30	+36	+42
				+6	+6	+6	+6	+6
x^3	1	8	27	64	125	216	343	512
es fehlt:	2	3	4	5	6	7	8	9
		+1	+1	+1	+1	+1	+1	+1
x	1	2	3	4	5	6	7	8
es fehlt:	1	1	1	1	1	1	1	1

--> x^3

--> $+x$

--> $+1$

$x^3 + x + 1$

3

x	1	2	3	4	5	6	7	8
T_x	0	16	50	108	196	320	486	700
		+16	+34	+58	+88	+124	+166	+214
			+18	+24	+30	+36	+42	+48
				+6	+6	+6	+6	+6
x^3	1	8	27	64	125	216	343	512
es fehlt:	-1	8	23	44	71	104	143	188
		+9	+15	+21	+27	+33	+39	+45
			+6	+6	+6	+6	+6	+6
$3x^2$	3	12	27	48	75	108	147	192
es fehlt:	-4	-4	-4	-4	-4	-4	-4	-4

--> x^3

--> $+3x^2$

--> -4

$x^3 + 3x^2 - 4$

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4

x	1	2	3	4	5	6	7	8
T_x	8	30	80	170	312	518	800	1'170
		+22	+50	+90	+142	+206	+282	+370
			+28	+40	+52	+64	+76	+88
			+12	+12	+12	+12	+12	--> $2x^3$
$2x^3$	2	16	54	128	250	432	686	1'024
es fehlt:	6	14	26	42	62	86	114	146
		+8	+12	+16	+20	+24	+28	+32
			+4	+4	+4	+4	+4	--> $+2x^2$
$2x^2$	2	8	18	32	50	72	98	128
es fehlt:	4	6	8	10	12	14	16	18
		+2	+2	+2	+2	+2	+2	+2 --> $+2x$
$2x$	2	4	6	8	10	12	14	16
es fehlt:	2	2	2	2	2	2	2	2 --> $+2$

$2x^3 + 2x^2 + 2x + 2$

5

x	1	2	3	4	5	6	7	8
T_x	9	39	117	267	513	879	1'389	2'067
		+30	+78	+150	+246	+366	+510	+678
			+48	+72	+96	+120	+144	+168
			+24	+24	+24	+24	+24	--> $4x^3$
$4x^3$	4	32	108	256	500	864	1'372	2'048
es fehlt:	5	7	9	11	13	15	17	19
		+2	+2	+2	+2	+2	+2	+2 --> $+2x$
$2x$	2	4	6	8	10	12	14	16
es fehlt:	3	3	3	3	3	3	3	3 --> $+3$

$4x^3 + 2x + 3$

6

x	1	2	3	4	5	6	7	8
T_x	1	16	81	256	625	1'296	2'401	4'096
		+15	+65	+175	+369	+671	+1'105	+1'695
			+50	+110	+194	+302	+434	+590
			+60	+84	+108	+132	+156	
			+24	+24	+24	+24		--> x^4
x^4	1	16	81	256	625	1'296	2'401	4'096
es fehlt:	0	0	0	0	0	0	0	0 --> <u>x^4</u>

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7

x	1	2	3	4	5	6	7	8
T_x	1	27	117	337	777	1'551	2'797	4'677
		+26	+90	+220	+440	+774	+1'246	+1'880
			+64	+130	+220	+334	+472	+634
				+66	+90	+114	+138	+162
				+24	+24	+24	+24	
								--> x^4
x^4	1	16	81	256	625	1'296	2'401	4'096
es fehlt:	0	11	36	81	152	255	396	581
		+11	+25	+45	+71	+103	+141	+185
			+14	+20	+26	+32	+38	+44
				+6	+6	+6	+6	
								--> x^3
x^3	1	8	27	64	125	216	343	512
es fehlt:	-1	3	9	17	27	39	53	69
		+4	+6	+8	+10	+12	+14	+16
			+2	+2	+2	+2	+2	
								--> x^2
x^2	1	4	9	16	25	36	49	64
es fehlt:	-2	-1	0	1	2	3	4	5
		+1	+1	+1	+1	+1	+1	+1
								--> x
x	1	2	3	4	5	6	7	8
es fehlt:	-3	-3	-3	-3	-3	-3	-3	-3
								--> -3

$x^4 + x^3 + x^2 + x - 3$

8

x	1	2	3	4	5	6	7	8
T_x	-7	-20	-31	-4	121	428	1'025	2'044
		-13	-11	+27	+125	+307	+597	+1'019
			+2	+38	+98	+182	+290	+422
				+36	+60	+84	+108	+132
				+24	+24	+24	+24	
								--> x^4
x^4	1	16	81	256	625	1'296	2'401	4'096
es fehlt:	-8	-36	-112	-260	-504	-868	-1'376	-2'052
		-28	-76	-148	-244	-364	-508	-676
			-48	-72	-96	-120	-144	-168
				-24	-24	-24	-24	
								--> $-4x^3$
$-4x^3$	-4	-32	-108	-256	-500	-864	-1'372	-2'048
es fehlt:	-4	-4	-4	-4	-4	-4	-4	-4
								--> -4

$x^4 - 4x^3 - 4$

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9

x	1	2	3	4	5	6	7	8
T_x	0	1	28	129	376	865	1'716	3'073
		+1	+27	+101	+247	+489	+851	+1357
			+26	+74	+146	+242	+362	+506
			+48	+72	+96	+120	+144	
			+24	+24	+24	+24		--> x^4
x^4	1	16	81	256	625	1'296	2'401	4'096
es fehlt:	-1	-15	-53	-127	-249	-431	-685	-1023
		-14	-38	-74	-122	-182	-254	-338
			-24	-36	-48	-60	-72	-84
			-12	-12	-12	-12	-12	--> $-2x^3$
$-2x^3$	-2	-16	-54	-128	-250	-432	-686	-1'024
es fehlt:	1	1	1	1	1	1	1	1 --> $+1$
								<u>$x^4 - 2x^3 + 1$</u>

10

x	1	2	3	4	5	6	7	8
T_x	1	32	243	1'024	3'125	7'776	16'807	32'768
		+31	+211	+781	+2'101	+4'651	+9'031	+15'961
			+180	+570	+1'320	+2'550	+4'380	+6'930
			+390	+750	+1'230	+1'830	+2'550	
			+360	+480	+600	+720		
			+120	+120	+120			--> x^5
x^5	1	32	243	1'024	3'125	7'776	16'807	32'768
es fehlt:	0	0	0	0	0	0	0	0 --> <u>x^5</u>

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11

x	1	2	3	4	5	6	7	8
T_x	3	56	351	1'344	3'875	9'288	19'551	37'376
		+53	+295	+993	+2'531	+5'413	+10'263	+17'825
			+242	+698	+1'538	+2'882	+4'850	+7'562
			+456	+840	+1'344	+1'968	+2'712	
			+384	+504	+624	+744		
			+120	+120	+120			--> x^5
x^5	1	32	243	1'024	3'125	7'776	16'807	32'768
es fehlt:	2	24	108	320	750	1'512	2'744	4'608
		+22	+84	+212	+430	+762	+1'232	+1'864
			+62	+128	+218	+332	+470	+632
			+66	+90	+114	+138	+162	
			+24	+24	+24	+24		--> x^4
x^4	1	16	81	256	625	1'296	2'401	4'096
es fehlt:	1	8	27	64	125	316	343	512
		+7	+19	+37	+62	+91	+127	+169
			+12	+18	+24	+30	+36	+42
			+6	+6	+6	+6	+6	--> x^3
x^3	1	8	27	64	125	216	343	512
es fehlt:	0	0	0	0	0	0	0	0

$x^5 + x^4 + x^3$

12

x	1	2	3	4	5	6	7	8
T_x	2	80	536	2'156	6'446	15'872	34'100	66'236
		+78	+456	+1'620	+4'290	+9'426	+18'228	+32'136
			+378	+1'164	+2'670	+5'136	+8'802	+13'908
			+786	+1'506	+2'466	+3'666	+5'106	
			+720	+960	+1'200	+1'440		
			+240	+240	+240			--> $2x^5$
$2x^5$	2	64	486	2'048	6'250	15'552	33'614	65'536
es fehlt:	0	16	50	108	196	320	486	700
		+16	+34	+58	+88	+124	+166	+214
			+18	+24	+30	+36	+42	+48
			+6	+6	+6	+6	+6	--> x^3
x^3	1	8	27	64	125	216	343	512
es fehlt:	-1	8	23	44	71	104	143	188
		+9	+15	+21	+27	+33	+39	+45
			+6	+6	+6	+6	+6	--> $+3x^2$
$3x^2$	3	12	27	48	75	108	147	192
es fehlt:	-4	-4	-4	-4	-4	-4	-4	-4 --> -4

$2x^5 + x^3 + 3x^2 - 4$

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13

x	1	2	3	4	5	6	7	8
T_x	3	$17\frac{1}{3}$	53	120	$228\frac{1}{3}$	388	609	$901\frac{1}{3}$
		$+14\frac{1}{3}$	$+35\frac{2}{3}$	+67	$+108\frac{1}{3}$	$+159\frac{2}{3}$	221	$+292\frac{1}{3}$
			$+21\frac{1}{3}$	$+31\frac{1}{3}$	$+41\frac{1}{3}$	$+51\frac{1}{3}$	$+61\frac{1}{3}$	$+71\frac{1}{3}$
			+10	+10	+10	+10	+10	

$$\rightarrow \frac{10}{6}x^3 = \frac{5}{3}x^3$$

$\frac{5}{3}x^3$	$1\frac{2}{3}$	$13\frac{1}{3}$	45	$106\frac{2}{3}$	$208\frac{1}{3}$	360	$571\frac{2}{3}$
es fehlt:	$1\frac{1}{3}$	4	8	$13\frac{1}{3}$	20	28	$37\frac{1}{3}$
		$+2\frac{2}{3}$	+4	$+5\frac{1}{3}$	$+6\frac{2}{3}$	+8	$+9\frac{1}{3}$
			$+\frac{4}{3}$	$+\frac{4}{3}$	$+\frac{4}{3}$	$+\frac{4}{3}$	$+\frac{4}{3}$

$$\rightarrow \frac{2}{3}x^2$$

$\frac{2}{3}x^2$	$\frac{2}{3}$	$2\frac{2}{3}$	6	$10\frac{2}{3}$	$16\frac{2}{3}$	24	$32\frac{2}{3}$
es fehlt:	$\frac{2}{3}$	$1\frac{1}{3}$	2	$2\frac{2}{3}$	$3\frac{1}{3}$	4	$4\frac{2}{3}$
	$\frac{2}{3}$		$\frac{2}{3}$	$\frac{2}{3}$	$\frac{2}{3}$	$\frac{2}{3}$	$\frac{2}{3}$

$$\rightarrow \frac{2}{3}x$$

$$\underline{\underline{\frac{5}{3}x^3 + \frac{2}{3}x^2 + \frac{2}{3}x}}$$