

**Prof. Dr. Alfred Toth**

## **Die 1162 polykontextural-semiotischen Funktionen**

### 1. Allgemeines zu polykontextural-semiotischen Funktionen

In Toth (2008b) wurden polykontextural-semiotische Handlungsschemata eingeführt. Sie basieren auf der polykontexturalen Zeichenrelation (PZR)

$$\text{PZR} = (3.a \ 2.b \ 1.c \ 0.d),$$

die sich von der monokontexturalen Peirce-Benseschen Zeichenrelation (ZR)

$$\text{ZR} = (3.a \ 2.b \ 1.c)$$

durch Einbettung oder Lokalisierung des kategorialen Objektes der Nullheit (0.d) in seiner trichotomischen Ausdifferenzierung als Sekanz (0.1), Semanz (0.2) oder Selektanz (0.3) unterscheidet. PZR ist polykontextural, weil damit die Grenze zwischen Zeichen und Objekt formal aufgehoben ist.

Polykontextural-semiotische tetradische Handlungsschemata basieren nun auf semiotischen triadischen Kreationsschemata der allgemeinen Form

$$\left( \begin{array}{c} (c.d) \\ \wedge \gg (e.f) \\ (a.b) \end{array} \right) \times \left( \begin{array}{c} (b.a) \\ \wedge \gg (f.e) \\ (d.c) \end{array} \right)$$

wobei also nicht nur die Trichotomien, sondern auch die Triaden verallgemeinert werden, da neben regulären triadischen Zeichenklassen der Form (3.a 2.b 1.c) auch deren 6 Permutationen definiert sind (vgl. Toth 2008a, S. 177 ff.), so dass also von der allgemeinen Form  $\text{ZR} = (a.b \ c.d \ e.f)$  von triadischen Zeichenklassen ausgegangen wird. Da für polykontexturale Zeichenklassen also von der allgemeinen Form  $\text{PZR} = (a.b \ c.d \ e.f \ g.h)$  für Zeichenklassen ausgegangen wird, haben wir die folgende Form polykontexturaler Handlungsschemata

$$\left( \begin{array}{c} (c.d) \\ (a.b) \gg \vee \succ (g.h) \\ (e.f) \end{array} \right) \times \left( \begin{array}{c} (f.e) \\ (h.g) \gg \vee \succ (b.a) \\ (d.c) \end{array} \right)$$

so dass im tetradischen Falle also alle 24 Permutationen einer polykontexturalen Zeichenklasse definiert sind.

Der semiotische Funktionsbegriff wird nun als Abstraktion des semiotischen Handlungsbegriffs eingeführt, der seinerseits ja als Verallgemeinerung des semiotischen Kurationsbegriffs

griffs eingeführt worden war. Wir können nämlich die triadischen semiotischen Zeichenklassen nun wie folgt als monokontextural-semiotische Zeichenfunktionen schreiben

$$(a.b, c.d, e.f) \equiv (e.f) = f(a.b, c.d),$$

wobei, wie gesagt,  $a, b, c, d, e, f$  alle Werte  $\in \{1, 2, 3\}$  annehmen kann. Dasselbe gilt auch für die erweiterte Wertemenge  $a, \dots, h \in \{0, 1, 2, 3\}$  der tetradischen polykontexturalen Zeichenklassen, die wir nun wie folgt als polykontextural-semiotische Zeichenfunktionen einführen

$$(a.b, c.d, e.f, g.h) = (g.h) = f(a.b, c.d, e.f).$$

Ich möchte betonen, dass die Tatsache, dass  $a, \dots, h$  alle Werte annehmen können, zur Folge hat, dass durch polykontextural-semiotische Funktionen jedes Subzeichen "kreiert" wird, und zwar natürlich auch das kategoriale Objekt  $(0.d)$ ,  $d \in \{.1, .2, .3\}$ , so dass also sowohl ein Zeichen ein Objekt wie ein Objekt ein Zeichen erzeugen kann in Übereinstimmung mit der polykontexturalen Einführung der tetradischen Zeichenrelation PZR.

2. Bevor wir uns den 1162 möglichen polykontextural-semiotischen Funktionen, entsprechend der Anzahl der möglichen polykontextural-semiotischen Handlungsschemata, widmen, wollen wir noch auf einige allgemeine Besonderheiten dieser Funktionen hinweisen.

2.1. Es gibt homogene, homogen-heterogene und heterogene Funktionen. Beispiele:

$$\begin{aligned} (0.1) &= f(1.1, 2.1) \\ (2.1) &= f(1.1, 0.1) \\ (0.1) &= f(1.1, 2.1, 3.1) \end{aligned}$$

2.2. Es gibt komplementäre und nicht-komplementäre Funktionen. Beispiele:

$$\begin{aligned} (0.1) &= f(1.1, 2.1) & \text{vs.} & & (0.2) &= f(1.1, 2.1) \\ (2.1) &= f(2.2, 2.0) & \text{vs.} & & (2.1) &= f(2.0, 2.3) \\ (0.1) &= f(1.1, 2.1, 3.1) & \text{vs.} & & (0.2) &= f(1.2, 3.1, 2.2) \end{aligned}$$

2.3. Es gibt duale und nicht-duale Funktionen. Beispiele:

$$\begin{aligned} [(0.1) = f(1.1, 2.1)] &\times [(1.0) = f(1.2, 1.1)] \\ [(2.1) = f(0.3, 1.2)] &\times [(1.2) = f(2.1, 3.0)] \\ [(0.1) = f(1.1, 2.1, 3.1)] &\times [(1.0) = f(1.3, 1.2, 1.1)] \end{aligned}$$

3. Die 1162 polykontextural-semiotischen Funktionen sind also Funktionen über 2 (im Falle von partiellen Funktionen) oder über 3 Variablen:

Minimales Schema:  $w = (x, y)$

Maximales Schema:  $w = (x, y, z)$

3.1. 12 Funktionen mit  $w = (0.1)$

- |     |                          |   |   |
|-----|--------------------------|---|---|
| 1.  | (0.1) = f(1.1, 2.1)      | } |   |
| 2.  | (0.1) = f(1.1, 2.1, 3.1) | } | 2 |
| 3.  | (0.1) = f(1.1, 3.1)      | } |   |
| 4.  | (0.1) = f(1.1, 3.1, 2.1) | } | 2 |
| 5.  | (0.1) = f(2.1, 1.1)      | } |   |
| 6.  | (0.1) = f(2.1, 1.1, 3.1) | } | 2 |
| 7.  | (0.1) = f(2.1, 3.1)      | } |   |
| 8.  | (0.1) = f(2.1, 3.1, 1.1) | } | 2 |
| 9.  | (0.1) = f(3.1, 1.1)      | } |   |
| 10. | (0.1) = f(3.1, 1.1, 2.1) | } | 2 |
| 11. | (0.1) = f(3.1, 2.1)      | } |   |
| 12. | (0.1) = f(3.1, 2.1, 1.1) | } | 2 |

3.2. 41 Funktionen mit  $w = (0.2)$

- |     |                          |   |   |
|-----|--------------------------|---|---|
| 1.  | (0.2) = f(1.1, 2.1)      | } |   |
| 2.  | (0.2) = f(1.1, 2.1, 3.1) | } | 2 |
| 3.  | (0.2) = f(1.1, 3.1)      | } |   |
| 4.  | (0.2) = f(1.1, 3.1, 2.1) | } | 3 |
| 5.  | (0.2) = f(1.2, 2.1, 3.1) | } |   |
| 6.  | (0.2) = f(1.2, 2.2)      | } |   |
| 7.  | (0.2) = f(1.2, 2.2, 3.1) | } | 3 |
| 8.  | (0.2) = f(1.2, 2.2, 3.2) | } |   |
| 9.  | (0.2) = f(1.2, 3.1)      | } |   |
| 10. | (0.2) = f(1.2, 3.1, 2.1) | } | 3 |
| 11. | (0.2) = f(1.2, 3.1, 2.2) | } |   |
| 12. | (0.2) = f(1.2, 3.2)      | } |   |
| 13. | (0.2) = f(1.2, 3.2, 2.2) | } | 2 |
| 14. | (0.2) = f(2.1, 1.1)      | } |   |
| 15. | (0.2) = f(2.1, 1.1, 3.1) | } | 2 |
| 16. | (0.2) = f(2.1, 1.2)      | } |   |
| 17. | (0.2) = f(2.1, 1.2, 3.1) | } | 2 |
| 18. | (0.2) = f(2.1, 3.1)      | } |   |
| 19. | (0.2) = f(2.1, 3.1, 1.1) | } | 3 |
| 20. | (0.2) = f(2.1, 3.1, 1.2) | } |   |
| 21. | (0.2) = f(2.2, 1.2)      | } |   |
| 22. | (0.2) = f(2.2, 1.2, 3.1) | } | 3 |
| 23. | (0.2) = f(2.2, 1.2, 3.2) | } |   |
| 24. | (0.2) = f(2.2, 3.1)      | } |   |
| 25. | (0.2) = f(2.2, 3.1, 1.2) | } | 2 |
| 26. | (0.2) = f(2.2, 3.2)      | } |   |
| 27. | (0.2) = f(2.2, 3.2, 1.2) | } | 2 |
| 28. | (0.2) = f(3.1, 1.1)      | } |   |
| 29. | (0.2) = f(3.1, 1.1, 2.1) | } | 2 |

- |     |                          |   |   |
|-----|--------------------------|---|---|
| 30. | (0.2) = f(3.1, 1.2)      | } |   |
| 31. | (0.2) = f(3.1, 1.2, 2.1) | } | 3 |
| 32. | (0.2) = f(3.1, 1.2, 2.2) | } |   |
| 33. | (0.2) = f(3.1, 2.1)      | } |   |
| 34. | (0.2) = f(3.1, 2.1, 1.1) | } | 3 |
| 35. | (0.2) = f(3.1, 2.1, 1.2) | } |   |
| 36. | (0.2) = f(3.1, 2.2)      | } | 2 |
| 37. | (0.2) = f(3.1, 2.2, 1.2) | } |   |
| 38. | (0.2) = f(3.2, 1.2)      | } |   |
| 39. | (0.2) = f(3.2, 1.2, 2.2) | } | 2 |
| 40. | (0.2) = f(3.2, 2.2)      | } |   |
| 41. | (0.2) = f(3.2, 2.2, 1.2) | } | 2 |

3.3. 92 Funktionen mit  $w = (0.3)$

- |     |                          |   |   |
|-----|--------------------------|---|---|
| 1.  | (0.3) = f(1.1, 2.1)      | } |   |
| 2.  | (0.3) = f(1.1, 2.1, 3.1) | } | 2 |
| 3.  | (0.3) = f(1.1, 3.1)      | } |   |
| 4.  | (0.3) = f(1.1, 3.1, 2.1) | } | 2 |
| 5.  | (0.3) = f(1.2, 2.1)      | } |   |
| 6.  | (0.3) = f(1.2, 2.1, 3.1) | } | 2 |
| 7.  | (0.3) = f(1.2, 2.2)      | } |   |
| 8.  | (0.3) = f(1.2, 2.2, 3.1) | } | 3 |
| 9.  | (0.3) = f(1.2, 2.2, 3.2) | } |   |
| 10. | (0.3) = f(1.2, 3.1)      | } | 3 |
| 11. | (0.3) = f(1.2, 3.1, 2.1) | } |   |
| 12. | (0.3) = f(1.2, 3.1, 2.2) | } |   |
| 13. | (0.3) = f(1.2, 3.2)      | } | 2 |
| 14. | (0.3) = f(1.2, 3.2, 2.2) | } |   |
| 15. | (0.3) = f(1.3, 2.1)      | } | 2 |
| 16. | (0.3) = f(1.3, 2.1, 3.1) | } |   |
| 17. | (0.3) = f(1.3, 2.2)      | } | 3 |
| 18. | (0.3) = f(1.3, 2.2, 3.1) | } |   |
| 19. | (0.3) = f(1.3, 2.2, 3.2) | } |   |
| 20. | (0.3) = f(1.3, 2.3)      | } | 4 |
| 21. | (0.3) = f(1.3, 2.3, 3.1) | } |   |
| 22. | (0.3) = f(1.3, 2.3, 3.2) | } |   |
| 23. | (0.3) = f(1.3, 2.3, 3.3) | } | 4 |
| 24. | (0.3) = f(1.3, 3.1)      | } |   |
| 25. | (0.3) = f(1.3, 3.1, 2.1) | } |   |
| 26. | (0.3) = f(1.3, 3.1, 2.2) | } |   |
| 27. | (0.3) = f(1.3, 3.1, 2.3) | } | 3 |
| 28. | (0.3) = f(1.3, 3.2)      | } |   |
| 29. | (0.3) = f(1.3, 3.2, 2.2) | } | 3 |
| 30. | (0.3) = f(1.3, 3.2, 2.3) | } |   |
| 31. | (0.3) = f(1.3, 3.3)      | } |   |
| 32. | (0.3) = f(1.3, 3.3, 2.3) | } | 2 |

- |     |                            |   |   |
|-----|----------------------------|---|---|
| 33. | $(0.3) = f(2.1, 1.1)$      | } | 3 |
| 34. | $(0.3) = f(2.1, 1.1, 3.1)$ |   |   |
| 35. | $(0.3) = f(2.1, 1.2, 3.1)$ | } | 2 |
| 36. | $(0.3) = f(2.1, 1.3)$      |   |   |
| 37. | $(0.3) = f(2.1, 1.3, 3.1)$ | } | 4 |
| 38. | $(0.3) = f(2.1, 3.1)$      |   |   |
| 39. | $(0.3) = f(2.1, 3.1, 1.1)$ | } | 3 |
| 40. | $(0.3) = f(2.1, 3.1, 1.2)$ |   |   |
| 41. | $(0.3) = f(2.1, 3.1, 1.3)$ | } | 3 |
| 42. | $(0.3) = f(2.2, 1.2)$      |   |   |
| 43. | $(0.3) = f(2.2, 1.2, 3.1)$ | } | 3 |
| 44. | $(0.3) = f(2.2, 1.2, 3.2)$ |   |   |
| 45. | $(0.3) = f(2.2, 1.3)$      | } | 3 |
| 46. | $(0.3) = f(2.2, 1.3, 3.1)$ |   |   |
| 47. | $(0.3) = f(2.2, 1.3, 3.2)$ | } | 3 |
| 48. | $(0.3) = f(2.2, 3.1)$      |   |   |
| 49. | $(0.3) = f(2.2, 3.1, 1.2)$ | } | 3 |
| 50. | $(0.3) = f(2.2, 3.1, 1.3)$ |   |   |
| 51. | $(0.3) = f(2.2, 3.2)$      | } | 3 |
| 52. | $(0.3) = f(2.2, 3.2, 1.2)$ |   |   |
| 53. | $(0.3) = f(2.2, 3.2, 1.3)$ | } | 4 |
| 54. | $(0.3) = f(2.3, 1.3)$      |   |   |
| 55. | $(0.3) = f(2.3, 1.3, 3.1)$ | } | 2 |
| 56. | $(0.3) = f(2.3, 1.3, 3.2)$ |   |   |
| 57. | $(0.3) = f(2.3, 1.3, 3.3)$ | } | 3 |
| 58. | $(0.3) = f(2.3, 3.1)$      |   |   |
| 59. | $(0.3) = f(2.3, 3.1, 1.3)$ | } | 3 |
| 60. | $(0.3) = f(2.3, 3.2)$      |   |   |
| 61. | $(0.3) = f(2.3, 3.2, 1.3)$ | } | 4 |
| 62. | $(0.3) = f(2.3, 3.3, 1.3)$ |   |   |
| 63. | $(0.3) = f(3.1, 1.1)$      | } | 2 |
| 64. | $(0.3) = f(3.1, 1.1, 2.1)$ |   |   |
| 65. | $(0.3) = f(3.1, 1.2)$      | } | 3 |
| 66. | $(0.3) = f(3.1, 1.2, 2.1)$ |   |   |
| 67. | $(0.3) = f(3.1, 1.2, 2.2)$ | } | 4 |
| 68. | $(0.3) = f(3.1, 1.3)$      |   |   |
| 69. | $(0.3) = f(3.1, 1.3, 2.1)$ | } | 3 |
| 70. | $(0.3) = f(3.1, 1.3, 2.2)$ |   |   |
| 71. | $(0.3) = f(3.1, 1.3, 2.3)$ | } | 4 |
| 72. | $(0.3) = f(3.1, 2.1)$      |   |   |
| 73. | $(0.3) = f(3.1, 2.1, 1.1)$ | } | 3 |
| 74. | $(0.3) = f(3.1, 2.1, 1.2)$ |   |   |
| 75. | $(0.3) = f(3.1, 2.1, 1.3)$ | } | 2 |
| 76. | $(0.3) = f(3.1, 2.2)$      |   |   |
| 77. | $(0.3) = f(3.1, 2.2, 1.2)$ | } | 3 |
| 78. | $(0.3) = f(3.1, 2.2, 1.3)$ |   |   |
| 79. | $(0.3) = f(3.1, 2.3)$      | } | 2 |
| 80. | $(0.3) = f(3.1, 2.3, 1.3)$ |   |   |

- |     |                            |   |   |
|-----|----------------------------|---|---|
| 81. | $(0.3) = f(3.2, 1.2)$      | } | 2 |
| 82. | $(0.3) = f(3.2, 1.2, 2.2)$ |   |   |
| 83. | $(0.3) = f(3.2, 1.3)$      | } | 3 |
| 84. | $(0.3) = f(3.2, 1.3, 2.2)$ |   |   |
| 85. | $(0.3) = f(3.2, 1.3, 2.3)$ |   |   |
| 86. | $(0.3) = f(3.2, 2.2)$      | } | 3 |
| 87. | $(0.3) = f(3.2, 2.2, 1.2)$ |   |   |
| 88. | $(0.3) = f(3.2, 2.2, 1.3)$ |   |   |
| 89. | $(0.3) = f(3.2, 2.3)$      | } | 4 |
| 90. | $(0.3) = f(3.2, 2.3, 1.3)$ |   |   |
| 91. | $(0.3) = f(3.3, 1.3, 2.3)$ |   |   |
| 92. | $(0.3) = f(3.3, 2.3, 1.3)$ |   |   |

3.4. 12 Funktionen mit  $w = (1.0)$

- |     |                            |   |   |
|-----|----------------------------|---|---|
| 1.  | $(1.0) = f(1.1, 1.2)$      | } | 2 |
| 2.  | $(1.0) = f(1.1, 1.2, 1.3)$ |   |   |
| 3.  | $(1.0) = f(1.1, 1.3)$      | } | 2 |
| 4.  | $(1.0) = f(1.1, 1.3, 1.2)$ |   |   |
| 5.  | $(1.0) = f(1.2, 1.1)$      | } | 2 |
| 6.  | $(1.0) = f(1.2, 1.1, 1.3)$ |   |   |
| 7.  | $(1.0) = f(1.2, 1.3)$      | } | 2 |
| 8.  | $(1.0) = f(1.2, 1.3, 1.1)$ |   |   |
| 9.  | $(1.0) = f(1.3, 1.1)$      | } | 2 |
| 10. | $(1.0) = f(1.3, 1.1, 1.2)$ |   |   |
| 11. | $(1.0) = f(1.3, 1.2)$      | } | 2 |
| 12. | $(1.0) = f(1.3, 1.2, 1.1)$ |   |   |

3.5. 64 Funktionen mit  $w = (1.1)$

- |     |                            |   |   |
|-----|----------------------------|---|---|
| 1.  | $(1.1) = f(0.1, 2.1)$      | } | 2 |
| 2.  | $(1.1) = f(0.1, 2.1, 3.1)$ |   |   |
| 3.  | $(1.1) = f(0.1, 3.1)$      | } | 2 |
| 4.  | $(1.1) = f(0.1, 3.1, 2.1)$ |   |   |
| 5.  | $(1.1) = f(0.2, 2.1)$      | } | 2 |
| 6.  | $(1.1) = f(0.2, 2.1, 3.1)$ |   |   |
| 7.  | $(1.1) = f(0.2, 3.1)$      | } | 2 |
| 8.  | $(1.1) = f(0.2, 3.1, 2.1)$ |   |   |
| 9.  | $(1.1) = f(0.3, 2.1)$      | } | 2 |
| 10. | $(1.1) = f(0.3, 2.1, 3.1)$ |   |   |
| 11. | $(1.1) = f(0.3, 3.1)$      | } | 2 |
| 12. | $(1.1) = f(0.3, 3.1, 2.1)$ |   |   |
| 13. | $(1.1) = f(1.0, 1.2)$      | } | 2 |
| 14. | $(1.1) = f(1.0, 1.2, 1.3)$ |   |   |
| 15. | $(1.1) = f(1.0, 1.3)$      | } | 2 |
| 16. | $(1.1) = f(1.0, 1.3, 1.2)$ |   |   |
| 17. | $(1.1) = f(1.2, 1.0)$      | } | 2 |
| 18. | $(1.1) = f(1.2, 1.0, 1.3)$ |   |   |

|     |                            |   |   |
|-----|----------------------------|---|---|
| 19. | $(1.1) = f(1.2, 1.3)$      | } | 4 |
| 20. | $(1.1) = f(1.2, 1.3, 1.0)$ |   |   |
| 21. | $(1.1) = f(1.2, 1.3, 2.0)$ |   |   |
| 22. | $(1.1) = f(1.2, 1.3, 3.0)$ |   |   |
| 23. | $(1.1) = f(1.2, 2.0)$      | } | 2 |
| 24. | $(1.1) = f(1.2, 2.0, 1.3)$ |   |   |
| 25. | $(1.1) = f(1.2, 3.0)$      | } | 2 |
| 26. | $(1.1) = f(1.2, 3.0, 1.3)$ |   |   |
| 27. | $(1.1) = f(1.3, 1.0)$      | } | 2 |
| 28. | $(1.1) = f(1.3, 1.0, 1.2)$ |   |   |
| 29. | $(1.1) = f(1.3, 1.2)$      | } | 4 |
| 30. | $(1.1) = f(1.3, 1.2, 1.0)$ |   |   |
| 31. | $(1.1) = f(1.3, 1.2, 2.0)$ |   |   |
| 32. | $(1.1) = f(1.3, 1.2, 3.0)$ |   |   |
| 33. | $(1.1) = f(1.3, 2.0)$      | } | 2 |
| 34. | $(1.1) = f(1.3, 2.0, 1.2)$ |   |   |
| 35. | $(1.1) = f(1.3, 3.0)$      | } | 2 |
| 36. | $(1.1) = f(1.3, 3.0, 1.2)$ |   |   |
| 37. | $(1.1) = f(2.0, 1.2)$      | } | 2 |
| 38. | $(1.1) = f(2.0, 1.2, 1.3)$ |   |   |
| 39. | $(1.1) = f(2.0, 1.3)$      | } | 2 |
| 40. | $(1.1) = f(2.0, 1.3, 1.2)$ |   |   |
| 41. | $(1.1) = f(2.1, 0.1)$      | } | 2 |
| 42. | $(1.1) = f(2.1, 0.1, 3.1)$ |   |   |
| 43. | $(1.1) = f(2.1, 0.2)$      | } | 2 |
| 44. | $(1.1) = f(2.1, 0.2, 3.1)$ |   |   |
| 45. | $(1.1) = f(2.1, 0.3)$      | } | 2 |
| 46. | $(1.1) = f(2.1, 0.3, 3.1)$ |   |   |
| 47. | $(1.1) = f(2.1, 3.1)$      | } | 4 |
| 48. | $(1.1) = f(2.1, 3.1, 0.1)$ |   |   |
| 49. | $(1.1) = f(2.1, 3.1, 0.2)$ |   |   |
| 50. | $(1.1) = f(2.1, 3.1, 0.3)$ |   |   |
| 51. | $(1.1) = f(3.0, 1.2)$      | } | 2 |
| 52. | $(1.1) = f(3.0, 1.2, 1.3)$ |   |   |
| 53. | $(1.1) = f(3.0, 1.3)$      | } | 2 |
| 54. | $(1.1) = f(3.0, 1.3, 1.2)$ |   |   |
| 55. | $(1.1) = f(3.1, 0.1)$      | } | 2 |
| 56. | $(1.1) = f(3.1, 0.1, 2.1)$ |   |   |
| 57. | $(1.1) = f(3.1, 0.2)$      | } | 2 |
| 58. | $(1.1) = f(3.1, 0.2, 2.1)$ |   |   |
| 59. | $(1.1) = f(3.1, 0.3)$      | } | 2 |
| 60. | $(1.1) = f(3.1, 0.3, 2.1)$ |   |   |
| 61. | $(1.1) = f(3.1, 2.1)$      | } | 4 |
| 62. | $(1.1) = f(3.1, 2.1, 0.1)$ |   |   |
| 63. | $(1.1) = f(3.1, 2.1, 0.2)$ |   |   |
| 64. | $(1.1) = f(3.1, 2.1, 0.3)$ |   |   |

3.6. 115 Funktionen mit  $w = (1.2)$

|     |                            |   |   |
|-----|----------------------------|---|---|
| 1.  | $(1.2) = f(0.2, 2.1)$      | } | 2 |
| 2.  | $(1.2) = f(0.2, 2.1, 3.1)$ |   |   |
| 3.  | $(1.2) = f(0.2, 2.2)$      | } | 3 |
| 4.  | $(1.2) = f(0.2, 2.2, 3.1)$ |   |   |
| 5.  | $(1.2) = f(0.2, 2.2, 3.2)$ | } | 3 |
| 6.  | $(1.2) = f(0.2, 3.1)$      |   |   |
| 7.  | $(1.2) = f(0.2, 3.1, 2.1)$ | } | 2 |
| 8.  | $(1.2) = f(0.2, 3.1, 2.2)$ |   |   |
| 9.  | $(1.2) = f(0.2, 3.2)$      | } | 2 |
| 10. | $(1.2) = f(0.2, 3.2, 2.2)$ |   |   |
| 11. | $(1.2) = f(0.3, 2.1)$      | } | 2 |
| 12. | $(1.2) = f(0.3, 2.1, 3.1)$ |   |   |
| 13. | $(1.2) = f(0.3, 2.2)$      | } | 3 |
| 14. | $(1.2) = f(0.3, 2.2, 3.1)$ |   |   |
| 15. | $(1.2) = f(0.3, 2.2, 3.2)$ | } | 3 |
| 16. | $(1.2) = f(0.3, 3.1)$      |   |   |
| 17. | $(1.2) = f(0.3, 3.1, 2.1)$ | } | 2 |
| 18. | $(1.2) = f(0.3, 3.1, 2.2)$ |   |   |
| 19. | $(1.2) = f(0.3, 3.2)$      | } | 2 |
| 20. | $(1.2) = f(0.3, 3.2, 2.2)$ |   |   |
| 21. | $(1.2) = f(1.0, 1.1)$      | } | 2 |
| 22. | $(1.2) = f(1.0, 1.1, 1.3)$ |   |   |
| 23. | $(1.2) = f(1.0, 1.3)$      | } | 2 |
| 24. | $(1.2) = f(1.0, 1.3, 1.1)$ |   |   |
| 25. | $(1.2) = f(1.1, 1.0)$      | } | 2 |
| 26. | $(1.2) = f(1.1, 1.0, 1.3)$ |   |   |
| 27. | $(1.2) = f(1.1, 1.3)$      | } | 4 |
| 28. | $(1.2) = f(1.1, 1.3, 1.0)$ |   |   |
| 29. | $(1.2) = f(1.1, 1.3, 2.0)$ | } | 2 |
| 30. | $(1.2) = f(1.1, 1.3, 3.0)$ |   |   |
| 31. | $(1.2) = f(1.1, 2.0)$      | } | 2 |
| 32. | $(1.2) = f(1.1, 2.0, 1.3)$ |   |   |
| 33. | $(1.2) = f(1.1, 3.0)$      | } | 2 |
| 34. | $(1.2) = f(1.1, 3.0, 1.3)$ |   |   |
| 35. | $(1.2) = f(1.3, 1.0)$      | } | 2 |
| 36. | $(1.2) = f(1.3, 1.0, 1.1)$ |   |   |
| 37. | $(1.2) = f(1.3, 1.1)$      | } | 4 |
| 38. | $(1.2) = f(1.3, 1.1, 1.0)$ |   |   |
| 39. | $(1.2) = f(1.3, 1.1, 2.0)$ | } | 2 |
| 40. | $(1.2) = f(1.3, 1.1, 3.0)$ |   |   |
| 41. | $(1.2) = f(1.3, 2.0)$      | } | 2 |
| 42. | $(1.2) = f(1.3, 2.0, 1.1)$ |   |   |
| 43. | $(1.2) = f(1.3, 2.1)$      | } | 2 |
| 44. | $(1.2) = f(1.3, 2.1, 2.0)$ |   |   |



|     |                            |   |   |
|-----|----------------------------|---|---|
| 45. | $(1.2) = f(1.3, 3.0)$      | } | 4 |
| 46. | $(1.2) = f(1.3, 3.0, 1.1)$ |   |   |
| 47. | $(1.2) = f(1.3, 3.0, 2.1)$ |   |   |
| 48. | $(1.2) = f(1.3, 3.0, 3.1)$ |   |   |
| 49. | $(1.2) = f(1.3, 3.1)$      | } | 2 |
| 50. | $(1.2) = f(1.3, 3.1, 3.0)$ |   |   |
| 51. | $(1.2) = f(2.0, 1.1)$      | } | 2 |
| 52. | $(1.2) = f(2.0, 1.3, 2.1)$ |   |   |
| 53. | $(1.2) = f(2.0, 1.3)$      | } | 2 |
| 54. | $(1.2) = f(2.0, 1.3, 1.1)$ |   |   |
| 55. | $(1.2) = f(2.0, 2.1)$      | } | 2 |
| 56. | $(1.2) = f(2.0, 2.1, 1.3)$ |   |   |
| 57. | $(1.2) = f(2.1, 0.2)$      | } | 2 |
| 58. | $(1.2) = f(2.1, 0.2, 3.1)$ |   |   |
| 59. | $(1.2) = f(2.1, 0.3)$      | } | 2 |
| 60. | $(1.2) = f(2.1, 0.3, 3.1)$ |   |   |
| 61. | $(1.2) = f(2.1, 1.3)$      | } | 3 |
| 62. | $(1.2) = f(2.1, 1.3, 2.0)$ |   |   |
| 63. | $(1.2) = f(2.1, 1.3, 3.0)$ |   |   |
| 64. | $(1.2) = f(2.1, 2.0)$      | } | 2 |
| 65. | $(1.2) = f(2.1, 2.0, 1.3)$ |   |   |
| 66. | $(1.2) = f(2.1, 3.0)$      | } | 2 |
| 67. | $(1.2) = f(2.1, 3.0, 1.3)$ |   |   |
| 68. | $(1.2) = f(2.1, 3.1)$      | } | 3 |
| 69. | $(1.2) = f(2.1, 3.1, 0.2)$ |   |   |
| 70. | $(1.2) = f(2.1, 3.1, 0.3)$ |   |   |
| 71. | $(1.2) = f(2.2, 0.2)$      | } | 3 |
| 72. | $(1.2) = f(2.2, 0.2, 3.1)$ |   |   |
| 73. | $(1.2) = f(2.2, 0.2, 3.2)$ |   |   |
| 74. | $(1.2) = f(2.2, 0.3)$      | } | 3 |
| 75. | $(1.2) = f(2.2, 0.3, 3.1)$ |   |   |
| 76. | $(1.2) = f(2.2, 0.3, 3.2)$ |   |   |
| 77. | $(1.2) = f(2.2, 3.1)$      | } | 3 |
| 78. | $(1.2) = f(2.2, 3.1, 0.2)$ |   |   |
| 79. | $(1.2) = f(2.2, 3.1, 0.3)$ |   |   |
| 80. | $(1.2) = f(2.2, 3.2)$      | } | 3 |
| 81. | $(1.2) = f(2.2, 3.2, 0.2)$ |   |   |
| 82. | $(1.2) = f(2.2, 3.2, 0.3)$ |   |   |
| 83. | $(1.2) = f(3.0, 1.1)$      | } | 2 |
| 84. | $(1.2) = f(3.0, 1.1, 1.3)$ |   |   |
| 85. | $(1.2) = f(3.0, 1.3)$      | } | 4 |
| 86. | $(1.2) = f(3.0, 1.3, 1.1)$ |   |   |
| 87. | $(1.2) = f(3.0, 1.3, 2.1)$ |   |   |
| 88. | $(1.2) = f(3.0, 1.3, 3.1)$ |   |   |
| 89. | $(1.2) = f(3.0, 2.1)$      | } | 2 |
| 90. | $(1.2) = f(3.0, 2.1, 1.3)$ |   |   |
| 91. | $(1.2) = f(3.0, 3.1)$      | } | 2 |
| 92. | $(1.2) = f(3.0, 3.1, 1.3)$ |   |   |

|      |                            |   |   |
|------|----------------------------|---|---|
| 93.  | $(1.2) = f(3.1, 0.2)$      | } | 3 |
| 94.  | $(1.2) = f(3.1, 0.2, 2.1)$ |   |   |
| 95.  | $(1.2) = f(3.1, 0.2, 2.2)$ | } | 3 |
| 96.  | $(1.2) = f(3.1, 0.3)$      |   |   |
| 97.  | $(1.2) = f(3.1, 0.3, 2.1)$ | } | 3 |
| 98.  | $(1.2) = f(3.1, 0.3, 2.2)$ |   |   |
| 99.  | $(1.2) = f(3.1, 1.3)$      | } | 2 |
| 100. | $(1.2) = f(3.1, 1.3, 3.0)$ |   |   |
| 101. | $(1.2) = f(3.1, 2.1)$      | } | 3 |
| 102. | $(1.2) = f(3.1, 2.1, 0.2)$ |   |   |
| 103. | $(1.2) = f(3.1, 2.1, 0.3)$ | } | 3 |
| 104. | $(1.2) = f(3.1, 2.2)$      |   |   |
| 105. | $(1.2) = f(3.1, 2.2, 0.2)$ | } | 3 |
| 106. | $(1.2) = f(3.1, 2.2, 0.3)$ |   |   |
| 107. | $(1.2) = f(3.1, 3.0)$      | } | 2 |
| 108. | $(1.2) = f(3.1, 3.0, 1.3)$ |   |   |
| 109. | $(1.2) = f(3.2, 0.2)$      | } | 2 |
| 110. | $(1.2) = f(3.2, 0.2, 2.2)$ |   |   |
| 111. | $(1.2) = f(3.2, 0.3)$      | } | 2 |
| 112. | $(1.2) = f(3.2, 0.3, 2.2)$ |   |   |
| 113. | $(1.2) = f(3.2, 2.2)$      | } | 3 |
| 114. | $(1.2) = f(3.2, 2.2, 0.2)$ |   |   |
| 115. | $(1.2) = f(3.2, 2.2, 0.3)$ | } |   |

3.7. 154 Funktionen mit  $w = (1.3)$

|     |                            |   |   |
|-----|----------------------------|---|---|
| 1.  | $(1.3) = f(0.3, 2.1)$      | } | 2 |
| 2.  | $(1.3) = f(0.3, 2.1, 3.1)$ |   |   |
| 3.  | $(1.3) = f(0.3, 2.2)$      | } | 3 |
| 4.  | $(1.3) = f(0.3, 2.2, 3.1)$ |   |   |
| 5.  | $(1.3) = f(0.3, 2.2, 3.2)$ | } | 4 |
| 6.  | $(1.3) = f(0.3, 2.3)$      |   |   |
| 7.  | $(1.3) = f(0.3, 2.3, 3.1)$ | } | 4 |
| 8.  | $(1.3) = f(0.3, 2.3, 3.2)$ |   |   |
| 9.  | $(1.3) = f(0.3, 2.3, 3.3)$ | } | 4 |
| 10. | $(1.3) = f(0.3, 3.1)$      |   |   |
| 11. | $(1.3) = f(0.3, 3.1, 2.1)$ | } | 4 |
| 12. | $(1.3) = f(0.3, 3.1, 2.2)$ |   |   |
| 13. | $(1.3) = f(0.3, 3.1, 2.3)$ | } | 3 |
| 14. | $(1.3) = f(0.3, 3.2)$      |   |   |
| 15. | $(1.3) = f(0.3, 3.2, 2.2)$ | } | 3 |
| 16. | $(1.3) = f(0.3, 3.2, 2.3)$ |   |   |
| 17. | $(1.3) = f(0.3, 3.3)$      | } | 2 |
| 18. | $(1.3) = f(0.3, 3.3, 2.3)$ |   |   |
| 19. | $(1.3) = f(1.0, 1.1)$      | } | 2 |
| 20. | $(1.3) = f(1.0, 1.1, 1.2)$ |   |   |
| 21. | $(1.3) = f(1.0, 1.2)$      | } | 2 |
| 22. | $(1.3) = f(1.0, 1.2, 1.1)$ |   |   |

|     |                            |   |   |
|-----|----------------------------|---|---|
| 23. | $(1.3) = f(1.1, 1.0)$      | } | 2 |
| 24. | $(1.3) = f(1.1, 1.0, 1.2)$ |   |   |
| 25. | $(1.3) = f(1.1, 1.2)$      | } | 4 |
| 26. | $(1.3) = f(1.1, 1.2, 1.0)$ |   |   |
| 27. | $(1.3) = f(1.1, 1.2, 2.0)$ |   |   |
| 28. | $(1.3) = f(1.1, 1.2, 3.0)$ |   |   |
| 29. | $(1.3) = f(1.1, 3.0)$      | } | 2 |
| 30. | $(1.3) = f(1.1, 3.0, 1.2)$ |   |   |
| 31. | $(1.3) = f(1.2, 1.0)$      | } | 2 |
| 32. | $(1.3) = f(1.2, 1.0, 1.1)$ |   |   |
| 33. | $(1.3) = f(1.2, 1.1)$      | } | 4 |
| 34. | $(1.3) = f(1.2, 1.1, 1.0)$ |   |   |
| 35. | $(1.3) = f(1.2, 1.1, 2.0)$ |   |   |
| 36. | $(1.3) = f(1.2, 1.1, 3.0)$ |   |   |
| 37. | $(1.3) = f(1.2, 2.0)$      | } | 3 |
| 38. | $(1.3) = f(1.2, 2.0, 1.1)$ |   |   |
| 39. | $(1.3) = f(1.2, 2.0, 2.1)$ |   |   |
| 40. | $(1.3) = f(1.2, 2.1)$      | } | 3 |
| 41. | $(1.3) = f(1.2, 2.1, 2.0)$ |   |   |
| 42. | $(1.3) = f(1.2, 2.1, 3.0)$ |   |   |
| 43. | $(1.3) = f(1.2, 3.0)$      | } | 3 |
| 44. | $(1.3) = f(1.2, 3.0, 1.1)$ |   |   |
| 45. | $(1.3) = f(1.2, 3.0, 2.1)$ |   |   |
| 46. | $(1.3) = f(1.2, 3.0, 3.1)$ | } | 2 |
| 47. | $(1.3) = f(1.2, 3.1)$      |   |   |
| 48. | $(1.3) = f(1.2, 3.1, 3.0)$ | } | 2 |
| 49. | $(1.3) = f(2.0, 1.1)$      |   |   |
| 50. | $(1.3) = f(2.0, 1.1, 1.2)$ | } | 3 |
| 51. | $(1.3) = f(2.0, 1.2)$      |   |   |
| 52. | $(1.3) = f(2.0, 1.2, 1.1)$ |   |   |
| 53. | $(1.3) = f(2.0, 1.2, 2.1)$ | } | 3 |
| 54. | $(1.3) = f(2.0, 2.1)$      |   |   |
| 55. | $(1.3) = f(2.0, 2.1, 1.2)$ | } | 2 |
| 56. | $(1.3) = f(2.0, 2.1, 2.2)$ |   |   |
| 57. | $(1.3) = f(2.0, 2.2)$      | } | 2 |
| 58. | $(1.3) = f(2.0, 2.2, 2.1)$ |   |   |
| 59. | $(1.3) = f(2.1, 0.3)$      | } | 2 |
| 60. | $(1.3) = f(2.1, 0.3, 3.1)$ |   |   |
| 61. | $(1.3) = f(2.1, 1.2)$      | } | 3 |
| 62. | $(1.3) = f(2.1, 1.2, 2.0)$ |   |   |
| 63. | $(1.3) = f(2.1, 1.2, 3.0)$ |   |   |
| 64. | $(1.3) = f(2.1, 2.0)$      | } | 3 |
| 65. | $(1.3) = f(2.1, 2.0, 1.2)$ |   |   |
| 66. | $(1.3) = f(2.1, 2.0, 2.2)$ |   |   |
| 67. | $(1.3) = f(2.1, 2.2)$      | } | 3 |
| 68. | $(1.3) = f(2.1, 2.2, 2.0)$ |   |   |
| 69. | $(1.3) = f(2.1, 2.2, 3.0)$ |   |   |

|      |                            |   |   |
|------|----------------------------|---|---|
| 70.  | $(1.3) = f(2.1, 3.0)$      | } | 3 |
| 71.  | $(1.3) = f(2.1, 3.0, 1.2)$ |   |   |
| 72.  | $(1.3) = f(2.1, 3.0, 2.2)$ |   |   |
| 73.  | $(1.3) = f(2.1, 3.1)$      | } | 2 |
| 74.  | $(1.3) = f(2.1, 3.1, 0.3)$ |   |   |
| 75.  | $(1.3) = f(2.2, 0.3)$      | } | 3 |
| 76.  | $(1.3) = f(2.2, 0.3, 3.1)$ |   |   |
| 77.  | $(1.3) = f(2.2, 0.3, 3.2)$ |   |   |
| 78.  | $(1.3) = f(2.2, 2.0)$      | } | 2 |
| 79.  | $(1.3) = f(2.2, 2.0, 2.1)$ |   |   |
| 80.  | $(1.3) = f(2.2, 2.1)$      | } | 3 |
| 81.  | $(1.3) = f(2.2, 2.1, 2.0)$ |   |   |
| 82.  | $(1.3) = f(2.2, 2.1, 3.0)$ |   |   |
| 83.  | $(1.3) = f(2.2, 3.0)$      | } | 3 |
| 84.  | $(1.3) = f(2.2, 3.0, 2.1)$ |   |   |
| 85.  | $(1.3) = f(2.2, 3.0, 3.1)$ |   |   |
| 86.  | $(1.3) = f(2.2, 3.1)$      | } | 3 |
| 87.  | $(1.3) = f(2.2, 3.1, 0.3)$ |   |   |
| 88.  | $(1.3) = f(2.2, 3.1, 3.0)$ |   |   |
| 89.  | $(1.3) = f(2.2, 3.2)$      | } | 2 |
| 90.  | $(1.3) = f(2.2, 3.2, 0.3)$ |   |   |
| 91.  | $(1.3) = f(2.3, 0.3)$      | } | 3 |
| 92.  | $(1.3) = f(2.3, 0.3, 3.1)$ |   |   |
| 93.  | $(1.3) = f(2.3, 0.3, 3.2)$ |   |   |
| 94.  | $(1.3) = f(2.3, 0.3, 3.3)$ | } | 2 |
| 95.  | $(1.3) = f(2.3, 3.1)$      |   |   |
| 96.  | $(1.3) = f(2.3, 3.1, 0.3)$ | } | 2 |
| 97.  | $(1.3) = f(2.3, 3.2)$      |   |   |
| 98.  | $(1.3) = f(2.3, 3.2, 0.3)$ | } | 2 |
| 99.  | $(1.3) = f(2.3, 3.3)$      |   |   |
| 100. | $(1.3) = f(2.3, 3.3, 0.3)$ | } | 2 |
| 101. | $(1.3) = f(3.0, 1.1)$      |   |   |
| 102. | $(1.3) = f(3.0, 1.1, 1.2)$ | } | 4 |
| 103. | $(1.3) = f(3.0, 1.2)$      |   |   |
| 104. | $(1.3) = f(3.0, 1.2, 1.1)$ |   |   |
| 105. | $(1.3) = f(3.0, 1.2, 2.1)$ | } | 3 |
| 106. | $(1.3) = f(3.0, 1.2, 3.1)$ |   |   |
| 107. | $(1.3) = f(3.0, 2.1)$      | } | 3 |
| 108. | $(1.3) = f(3.0, 2.1, 1.2)$ |   |   |
| 109. | $(1.3) = f(3.0, 2.1, 2.2)$ |   |   |
| 110. | $(1.3) = f(3.0, 2.2)$      | } | 3 |
| 111. | $(1.3) = f(3.0, 2.2, 2.1)$ |   |   |
| 112. | $(1.3) = f(3.0, 2.2, 3.1)$ | } | 4 |
| 113. | $(1.3) = f(3.0, 3.1)$      |   |   |
| 114. | $(1.3) = f(3.0, 3.1, 1.2)$ |   |   |
| 115. | $(1.3) = f(3.0, 3.1, 2.2)$ | } | 4 |
| 116. | $(1.3) = f(3.0, 3.1, 3.2)$ |   |   |

|      |                            |   |   |
|------|----------------------------|---|---|
| 117. | $(1.3) = f(3.0, 3.2)$      | } |   |
| 118. | $(1.3) = f(3.0, 3.2, 3.1)$ | } | 2 |
| 119. | $(1.3) = f(3.1, 0.3)$      | } |   |
| 120. | $(1.3) = f(3.1, 0.3, 2.1)$ | } |   |
| 121. | $(1.3) = f(3.1, 0.3, 2.2)$ | } | 4 |
| 122. | $(1.3) = f(3.1, 0.3, 2.3)$ | } |   |
| 123. | $(1.3) = f(3.1, 1.2)$      | } |   |
| 124. | $(1.3) = f(3.1, 1.2, 3.0)$ | } | 2 |
| 125. | $(1.3) = f(3.1, 2.1)$      | } |   |
| 126. | $(1.3) = f(3.1, 2.1, 0.3)$ | } | 2 |
| 127. | $(1.3) = f(3.1, 2.2)$      | } |   |
| 128. | $(1.3) = f(3.1, 2.2, 0.3)$ | } | 3 |
| 129. | $(1.3) = f(3.1, 2.2, 3.0)$ | } |   |
| 130. | $(1.3) = f(3.1, 2.3)$      | } |   |
| 131. | $(1.3) = f(3.1, 2.3, 0.3)$ | } | 2 |
| 132. | $(1.3) = f(3.1, 3.0)$      | } |   |
| 133. | $(1.3) = f(3.1, 3.0, 1.2)$ | } |   |
| 134. | $(1.3) = f(3.1, 3.0, 2.2)$ | } | 4 |
| 135. | $(1.3) = f(3.1, 3.0, 3.2)$ | } |   |
| 136. | $(1.3) = f(3.1, 3.2)$      | } |   |
| 137. | $(1.3) = f(3.1, 3.2, 3.0)$ | } | 2 |
| 138. | $(1.3) = f(3.2, 0.3)$      | } |   |
| 139. | $(1.3) = f(3.2, 0.3, 2.2)$ | } | 3 |
| 140. | $(1.3) = f(3.2, 0.3, 2.3)$ | } |   |
| 141. | $(1.3) = f(3.2, 2.2)$      | } |   |
| 142. | $(1.3) = f(3.2, 2.2, 0.3)$ | } | 2 |
| 143. | $(1.3) = f(3.2, 2.3)$      | } |   |
| 144. | $(1.3) = f(3.2, 2.3, 0.3)$ | } | 2 |
| 145. | $(1.3) = f(3.2, 3.0)$      | } |   |
| 146. | $(1.3) = f(3.2, 3.0, 3.1)$ | } | 2 |
| 147. | $(1.3) = f(3.2, 3.1)$      | } |   |
| 148. | $(1.3) = f(3.2, 3.1, 3.0)$ | } | 2 |
| 149. | $(1.3) = f(3.3, 0.3)$      | } |   |
| 150. | $(1.3) = f(3.3, 0.3, 2.3)$ | } | 2 |
| 151. | $(1.3) = f(3.3, 2.3)$      | } |   |
| 152. | $(1.3) = f(3.3, 2.3, 0.3)$ | } | 2 |

### 3.8. 41 Funktionen mit $w = (2.0)$

|    |                            |   |   |
|----|----------------------------|---|---|
| 1. | $(2.0) = f(1.1, 1.2)$      | } |   |
| 2. | $(2.0) = f(1.1, 1.2, 1.3)$ | } | 2 |
| 3. | $(2.0) = f(1.1, 1.3)$      | } |   |
| 4. | $(2.0) = f(1.1, 1.3, 1.2)$ | } | 2 |
| 5. | $(2.0) = f(1.2, 1.1)$      | } |   |
| 6. | $(2.0) = f(1.2, 1.1, 1.3)$ | } | 2 |

|     |                            |   |   |
|-----|----------------------------|---|---|
| 7.  | $(2.0) = f(1.2, 1.3)$      | } | 4 |
| 8.  | $(2.0) = f(1.2, 1.3, 1.1)$ |   |   |
| 9.  | $(2.0) = f(1.2, 1.3, 2.1)$ |   |   |
| 10. | $(2.0) = f(1.2, 2.1, 1.3)$ |   |   |
| 11. | $(2.0) = f(1.3, 1.1)$      | } | 2 |
| 12. | $(2.0) = f(1.3, 1.1, 1.2)$ |   |   |
| 13. | $(2.0) = f(1.3, 1.2)$      |   |   |
| 14. | $(2.0) = f(1.3, 1.2, 1.1)$ | } | 3 |
| 15. | $(2.0) = f(1.3, 1.2, 2.1)$ |   |   |
| 16. | $(2.0) = f(1.3, 2.1)$      |   |   |
| 17. | $(2.0) = f(1.3, 2.1, 1.2)$ | } | 3 |
| 18. | $(2.0) = f(1.3, 2.1, 2.2)$ |   |   |
| 19. | $(2.0) = f(1.3, 2.2)$      |   |   |
| 20. | $(2.0) = f(1.3, 2.2, 2.1)$ | } | 2 |
| 21. | $(2.0) = f(2.1, 1.2)$      |   |   |
| 22. | $(2.0) = f(2.1, 1.2, 1.3)$ | } |   |
| 23. | $(2.0) = f(2.1, 1.3)$      |   |   |
| 24. | $(2.0) = f(2.1, 1.3, 1.2)$ | } | 3 |
| 25. | $(2.0) = f(2.1, 1.3, 2.2)$ |   |   |
| 26. | $(2.0) = f(2.1, 2.2)$      |   |   |
| 27. | $(2.0) = f(2.1, 2.2, 1.3)$ | } | 3 |
| 28. | $(2.0) = f(2.1, 2.2, 2.3)$ |   |   |
| 29. | $(2.0) = f(2.1, 2.3)$      |   |   |
| 30. | $(2.0) = f(2.1, 2.3, 2.2)$ | } | 2 |
| 31. | $(2.0) = f(2.2, 1.3)$      |   |   |
| 32. | $(2.0) = f(2.2, 1.3, 2.1)$ | } |   |
| 33. | $(2.0) = f(2.2, 2.1)$      |   |   |
| 34. | $(2.0) = f(2.2, 2.1, 1.3)$ | } | 3 |
| 35. | $(2.0) = f(2.2, 2.1, 2.3)$ |   |   |
| 36. | $(2.0) = f(2.2, 2.3)$      |   |   |
| 37. | $(2.0) = f(2.2, 2.3, 2.1)$ | } | 2 |
| 38. | $(2.0) = f(2.3, 2.1)$      |   |   |
| 39. | $(2.0) = f(2.3, 2.1, 2.2)$ | } |   |
| 40. | $(2.0) = f(2.3, 2.2)$      |   |   |
| 41. | $(2.0) = f(2.3, 2.2, 2.1)$ | } | 2 |

### 3.9. 116 Funktionen mit $w = (2.1)$

|    |                            |   |   |
|----|----------------------------|---|---|
| 1. | $(2.1) = f(0.1, 1.1)$      | } | 2 |
| 2. | $(2.1) = f(0.1, 1.1, 3.1)$ |   |   |
| 3. | $(2.1) = f(0.2, 1.1)$      |   |   |
| 4. | $(2.1) = f(0.2, 1.1, 3.1)$ |   |   |
| 5. | $(2.1) = f(0.2, 1.2)$      | } | 2 |
| 6. | $(2.1) = f(0.2, 1.2, 3.1)$ |   |   |
| 7. | $(2.1) = f(0.2, 3.1)$      |   |   |
| 8. | $(2.1) = f(0.2, 3.1, 1.1)$ | } | 3 |
| 9. | $(2.1) = f(0.2, 3.1, 1.2)$ |   |   |

|     |                            |   |   |
|-----|----------------------------|---|---|
| 10. | $(2.1) = f(0.3, 1.1)$      | } | 2 |
| 11. | $(2.1) = f(0.3, 1.1, 3.1)$ |   |   |
| 12. | $(2.1) = f(0.3, 1.2)$      | } | 2 |
| 13. | $(2.1) = f(0.3, 1.2, 3.1)$ |   |   |
| 14. | $(2.1) = f(0.3, 1.3)$      | } | 2 |
| 15. | $(2.1) = f(0.3, 1.3, 3.1)$ |   |   |
| 16. | $(2.1) = f(0.3, 3.1)$      | } | 4 |
| 17. | $(2.1) = f(0.3, 3.1, 1.1)$ |   |   |
| 18. | $(2.1) = f(0.3, 3.1, 1.2)$ |   |   |
| 19. | $(2.1) = f(0.3, 3.1, 1.3)$ |   |   |
| 20. | $(2.1) = f(1.1, 0.1)$      | } | 2 |
| 21. | $(2.1) = f(1.1, 0.1, 3.1)$ |   |   |
| 22. | $(2.1) = f(1.1, 0.2)$      | } | 2 |
| 23. | $(2.1) = f(1.1, 0.2, 3.1)$ |   |   |
| 24. | $(2.1) = f(1.1, 0.3)$      | } | 2 |
| 25. | $(2.1) = f(1.1, 0.3, 3.1)$ |   |   |
| 26. | $(2.1) = f(1.1, 3.1)$      | } | 4 |
| 27. | $(2.1) = f(1.1, 3.1, 0.1)$ |   |   |
| 28. | $(2.1) = f(1.1, 3.1, 0.2)$ |   |   |
| 29. | $(2.1) = f(1.1, 3.1, 0.3)$ |   |   |
| 30. | $(2.1) = f(1.2, 0.2)$      | } | 2 |
| 31. | $(2.1) = f(1.2, 0.2, 3.1)$ |   |   |
| 32. | $(2.1) = f(1.2, 0.3)$      | } | 3 |
| 33. | $(2.1) = f(1.2, 0.3, 3.1)$ |   |   |
| 34. | $(2.1) = f(1.2, 1.3, 3.0)$ |   |   |
| 35. | $(2.1) = f(1.2, 1.3)$      | } | 2 |
| 36. | $(2.1) = f(1.2, 1.3, 2.0)$ |   |   |
| 37. | $(2.1) = f(1.2, 2.0)$      | } | 2 |
| 38. | $(2.1) = f(1.2, 2.0, 1.3)$ |   |   |
| 39. | $(2.1) = f(1.2, 3.0)$      | } | 2 |
| 40. | $(2.1) = f(1.2, 3.0, 1.3)$ |   |   |
| 41. | $(2.1) = f(1.2, 3.1)$      | } | 3 |
| 42. | $(2.1) = f(1.2, 3.1, 0.2)$ |   |   |
| 43. | $(2.1) = f(1.2, 3.1, 0.3)$ |   |   |
| 44. | $(2.1) = f(1.3, 0.3)$      | } | 2 |
| 45. | $(2.1) = f(1.3, 0.3, 3.1)$ |   |   |
| 46. | $(2.1) = f(1.3, 1.2)$      | } | 3 |
| 47. | $(2.1) = f(1.3, 1.2, 2.0)$ |   |   |
| 48. | $(2.1) = f(1.3, 1.2, 3.0)$ |   |   |
| 49. | $(2.1) = f(1.3, 2.0)$      | } | 3 |
| 50. | $(2.1) = f(1.3, 2.0, 1.2)$ |   |   |
| 51. | $(2.1) = f(1.3, 2.0, 2.2)$ |   |   |
| 52. | $(2.1) = f(1.3, 2.2)$      | } | 3 |
| 53. | $(2.1) = f(1.3, 2.2, 2.0)$ |   |   |
| 54. | $(2.1) = f(1.3, 2.2, 3.0)$ |   |   |
| 55. | $(2.1) = f(1.3, 3.0)$      | } | 3 |
| 56. | $(2.1) = f(1.3, 3.0, 1.2)$ |   |   |
| 57. | $(2.1) = f(1.3, 3.0, 2.2)$ |   |   |

|      |                            |   |   |
|------|----------------------------|---|---|
| 58.  | $(2.1) = f(1.3, 3.1)$      | } | 2 |
| 59.  | $(2.1) = f(1.3, 3.1, 0.3)$ |   |   |
| 60.  | $(2.1) = f(2.0, 1.2)$      | } | 2 |
| 61.  | $(2.1) = f(2.0, 1.2, 1.3)$ |   |   |
| 62.  | $(2.1) = f(2.0, 1.3)$      | } | 3 |
| 63.  | $(2.1) = f(2.0, 1.3, 1.2)$ |   |   |
| 64.  | $(2.1) = f(2.0, 1.3, 2.2)$ |   |   |
| 65.  | $(2.1) = f(2.0, 2.2)$      | } | 3 |
| 66.  | $(2.1) = f(2.0, 2.2, 1.3)$ |   |   |
| 67.  | $(2.1) = f(2.0, 2.2, 2.3)$ |   |   |
| 68.  | $(2.1) = f(2.0, 2.3)$      | } | 2 |
| 69.  | $(2.1) = f(2.0, 2.3, 2.2)$ |   |   |
| 70.  | $(2.1) = f(2.2, 1.3)$      | } | 3 |
| 71.  | $(2.1) = f(2.2, 1.3, 2.0)$ |   |   |
| 72.  | $(2.1) = f(2.2, 1.3, 3.0)$ |   |   |
| 73.  | $(2.1) = f(2.2, 2.0)$      | } | 3 |
| 74.  | $(2.1) = f(2.2, 2.0, 1.3)$ |   |   |
| 75.  | $(2.1) = f(2.2, 2.0, 2.3)$ |   |   |
| 76.  | $(2.1) = f(2.2, 2.3)$      | } | 3 |
| 77.  | $(2.1) = f(2.2, 2.3, 2.0)$ |   |   |
| 78.  | $(2.1) = f(2.2, 2.3, 3.0)$ |   |   |
| 79.  | $(2.1) = f(2.2, 3.0)$      | } | 3 |
| 80.  | $(2.1) = f(2.2, 3.0, 1.3)$ |   |   |
| 81.  | $(2.1) = f(2.2, 3.0, 2.3)$ |   |   |
| 82.  | $(2.1) = f(2.3, 2.0)$      | } | 2 |
| 83.  | $(2.1) = f(2.3, 2.0, 2.2)$ |   |   |
| 84.  | $(2.1) = f(2.3, 2.2)$      | } | 3 |
| 85.  | $(2.1) = f(2.3, 2.2, 2.0)$ |   |   |
| 86.  | $(2.1) = f(2.3, 2.2, 3.0)$ |   |   |
| 87.  | $(2.1) = f(2.3, 3.0)$      | } | 2 |
| 88.  | $(2.1) = f(2.3, 3.0, 2.2)$ |   |   |
| 89.  | $(2.1) = f(3.0, 1.2)$      | } | 2 |
| 90.  | $(2.1) = f(3.0, 1.2, 1.3)$ |   |   |
| 91.  | $(2.1) = f(3.0, 1.3)$      | } | 3 |
| 92.  | $(2.1) = f(3.0, 1.3, 1.2)$ |   |   |
| 93.  | $(2.1) = f(3.0, 1.3, 2.2)$ |   |   |
| 94.  | $(2.1) = f(3.0, 2.2)$      | } | 3 |
| 95.  | $(2.1) = f(3.0, 2.2, 1.3)$ |   |   |
| 96.  | $(2.1) = f(3.0, 2.2, 2.3)$ |   |   |
| 97.  | $(2.1) = f(3.0, 2.3)$      | } | 2 |
| 98.  | $(2.1) = f(3.0, 2.3, 2.2)$ |   |   |
| 99.  | $(2.1) = f(3.1, 0.1)$      | } | 2 |
| 100. | $(2.1) = f(3.1, 0.1, 1.1)$ |   |   |
| 101. | $(2.1) = f(3.1, 0.2)$      | } | 3 |
| 102. | $(2.1) = f(3.1, 0.2, 1.1)$ |   |   |
| 103. | $(2.1) = f(3.1, 0.2, 1.2)$ |   |   |



- |      |                            |   |   |
|------|----------------------------|---|---|
| 104. | $(2.1) = f(3.1, 0.3)$      | } | 4 |
| 105. | $(2.1) = f(3.1, 0.3, 1.1)$ |   |   |
| 106. | $(2.1) = f(3.1, 0.3, 1.2)$ |   |   |
| 107. | $(2.1) = f(3.1, 0.3, 1.3)$ | } | 4 |
| 108. | $(2.1) = f(3.1, 1.1)$      |   |   |
| 109. | $(2.1) = f(3.1, 1.1, 0.1)$ |   |   |
| 110. | $(2.1) = f(3.1, 1.1, 0.2)$ | } | 3 |
| 111. | $(2.1) = f(3.1, 1.1, 0.3)$ |   |   |
| 112. | $(2.1) = f(3.1, 1.2)$      | } | 2 |
| 113. | $(2.1) = f(3.1, 1.2, 0.2)$ |   |   |
| 114. | $(2.1) = f(3.1, 1.2, 0.3)$ | } | 3 |
| 115. | $(2.1) = f(3.1, 1.3)$      |   |   |
| 116. | $(2.1) = f(3.1, 1.3, 0.3)$ | } | 2 |
|      |                            |   |   |

3.10. 99 Funktionen mit  $w = (2.2)$

- |     |                            |   |   |
|-----|----------------------------|---|---|
| 1.  | $(2.2) = f(0.2, 1.2)$      | } | 3 |
| 2.  | $(2.2) = f(0.2, 1.2, 3.1)$ |   |   |
| 3.  | $(2.2) = f(0.2, 1.2, 3.2)$ |   |   |
| 4.  | $(2.2) = f(0.2, 3.1)$      | } | 2 |
| 5.  | $(2.2) = f(0.2, 3.1, 1.2)$ |   |   |
| 6.  | $(2.2) = f(0.2, 3.2)$      | } | 2 |
| 7.  | $(2.2) = f(0.2, 3.2, 1.2)$ |   |   |
| 8.  | $(2.2) = f(0.3, 1.2)$      | } | 3 |
| 9.  | $(2.2) = f(0.3, 1.2, 3.1)$ |   |   |
| 10. | $(2.2) = f(0.3, 1.2, 3.2)$ |   |   |
| 11. | $(2.2) = f(0.3, 1.3)$      | } | 3 |
| 12. | $(2.2) = f(0.3, 1.3, 3.1)$ |   |   |
| 13. | $(2.2) = f(0.3, 1.3, 3.2)$ |   |   |
| 14. | $(2.2) = f(0.3, 3.1)$      | } | 3 |
| 15. | $(2.2) = f(0.3, 3.1, 1.2)$ |   |   |
| 16. | $(2.2) = f(0.3, 3.1, 1.3)$ |   |   |
| 17. | $(2.2) = f(0.3, 3.2)$      | } | 3 |
| 18. | $(2.2) = f(0.3, 3.2, 1.2)$ |   |   |
| 19. | $(2.2) = f(0.3, 3.2, 1.3)$ |   |   |
| 20. | $(2.2) = f(1.2, 0.2)$      | } | 3 |
| 21. | $(2.2) = f(1.2, 0.2, 3.1)$ |   |   |
| 22. | $(2.2) = f(1.2, 0.2, 3.2)$ |   |   |
| 23. | $(2.2) = f(1.2, 0.3)$      | } | 3 |
| 24. | $(2.2) = f(1.2, 0.3, 3.1)$ |   |   |
| 25. | $(2.2) = f(1.2, 0.3, 3.2)$ |   |   |
| 26. | $(2.2) = f(1.2, 3.1)$      | } | 3 |
| 27. | $(2.2) = f(1.2, 3.1, 0.2)$ |   |   |
| 28. | $(2.2) = f(1.2, 3.1, 0.3)$ |   |   |
| 29. | $(2.2) = f(1.2, 3.2)$      | } | 3 |
| 30. | $(2.2) = f(1.2, 3.2, 0.2)$ |   |   |
| 31. | $(2.2) = f(1.2, 3.2, 0.3)$ |   |   |

|     |                            |   |   |
|-----|----------------------------|---|---|
| 32. | $(2.2) = f(1.3, 0.3)$      | } | 3 |
| 33. | $(2.2) = f(1.3, 0.3, 3.1)$ |   |   |
| 34. | $(2.2) = f(1.3, 0.3, 3.2)$ | } | 2 |
| 35. | $(2.2) = f(1.3, 2.0)$      |   |   |
| 36. | $(2.2) = f(1.3, 2.0, 2.1)$ | } | 3 |
| 37. | $(2.2) = f(1.3, 2.1)$      |   |   |
| 38. | $(2.2) = f(1.3, 2.1, 2.0)$ | } | 3 |
| 39. | $(2.2) = f(1.3, 2.1, 3.0)$ |   |   |
| 40. | $(2.2) = f(1.3, 3.0)$      | } | 3 |
| 41. | $(2.2) = f(1.3, 3.0, 2.1)$ |   |   |
| 42. | $(2.2) = f(1.3, 3.0, 3.1)$ | } | 3 |
| 43. | $(2.2) = f(1.3, 3.1)$      |   |   |
| 44. | $(2.2) = f(1.3, 3.1, 0.3)$ | } | 2 |
| 45. | $(2.2) = f(1.3, 3.1, 3.0)$ |   |   |
| 46. | $(2.2) = f(1.3, 3.2)$      | } | 2 |
| 47. | $(2.2) = f(1.3, 3.2, 0.3)$ |   |   |
| 48. | $(2.2) = f(2.0, 1.3)$      | } | 2 |
| 49. | $(2.2) = f(2.0, 1.3, 2.1)$ |   |   |
| 50. | $(2.2) = f(2.0, 2.1)$      | } | 3 |
| 51. | $(2.2) = f(2.0, 2.1, 1.3)$ |   |   |
| 52. | $(2.2) = f(2.0, 2.1, 2.3)$ | } | 2 |
| 53. | $(2.2) = f(2.0, 2.3)$      |   |   |
| 54. | $(2.2) = f(2.0, 2.3, 2.1)$ | } | 3 |
| 55. | $(2.2) = f(2.1, 1.3)$      |   |   |
| 56. | $(2.2) = f(2.1, 1.3, 2.0)$ | } | 3 |
| 57. | $(2.2) = f(2.1, 1.3, 3.0)$ |   |   |
| 58. | $(2.2) = f(2.1, 2.0)$      | } | 3 |
| 59. | $(2.2) = f(2.1, 2.0, 1.3)$ |   |   |
| 60. | $(2.2) = f(2.1, 2.0, 2.3)$ | } | 3 |
| 61. | $(2.2) = f(2.1, 2.3)$      |   |   |
| 62. | $(2.2) = f(2.1, 2.3, 2.0)$ | } | 3 |
| 63. | $(2.2) = f(2.1, 2.3, 3.0)$ |   |   |
| 64. | $(2.2) = f(2.1, 3.0)$      | } | 3 |
| 65. | $(2.2) = f(2.1, 3.0, 1.3)$ |   |   |
| 66. | $(2.2) = f(2.1, 3.0, 2.3)$ | } | 2 |
| 67. | $(2.2) = f(2.3, 2.0)$      |   |   |
| 68. | $(2.2) = f(2.3, 2.0, 2.1)$ | } | 3 |
| 69. | $(2.2) = f(2.3, 2.1)$      |   |   |
| 70. | $(2.2) = f(2.3, 2.1, 2.0)$ | } | 3 |
| 71. | $(2.2) = f(2.3, 2.1, 3.0)$ |   |   |
| 72. | $(2.2) = f(2.3, 3.0)$      | } | 3 |
| 73. | $(2.2) = f(2.3, 3.0, 2.1)$ |   |   |
| 74. | $(2.2) = f(2.3, 3.0, 3.1)$ | } | 2 |
| 75. | $(2.2) = f(2.3, 3.1)$      |   |   |
| 76. | $(2.2) = f(2.3, 3.1, 3.0)$ | } | 3 |
| 77. | $(2.2) = f(3.0, 1.3)$      |   |   |
| 78. | $(2.2) = f(3.0, 1.3, 2.1)$ | } | 3 |
| 79. | $(2.2) = f(3.0, 1.3, 3.1)$ |   |   |

- |      |                            |   |   |
|------|----------------------------|---|---|
| 80.  | $(2.2) = f(3.0, 2.1)$      | } | 3 |
| 81.  | $(2.2) = f(3.0, 2.1, 1.3)$ |   |   |
| 82.  | $(2.2) = f(3.0, 2.1, 2.3)$ |   |   |
| 83.  | $(2.2) = f(3.0, 2.3)$      | } | 3 |
| 84.  | $(2.2) = f(3.0, 2.3, 2.1)$ |   |   |
| 85.  | $(2.2) = f(3.0, 2.3, 3.1)$ |   |   |
| 86.  | $(2.2) = f(3.0, 3.1)$      | } | 3 |
| 87.  | $(2.2) = f(3.0, 3.1, 1.3)$ |   |   |
| 88.  | $(2.2) = f(3.0, 3.1, 2.3)$ |   |   |
| 89.  | $(2.2) = f(3.1, 0.2)$      | } | 2 |
| 90.  | $(2.2) = f(3.1, 0.2, 1.2)$ |   |   |
| 91.  | $(2.2) = f(3.1, 0.3)$      | } | 3 |
| 92.  | $(2.2) = f(3.1, 0.3, 1.2)$ |   |   |
| 93.  | $(2.2) = f(3.1, 0.3, 1.3)$ |   |   |
| 94.  | $(2.2) = f(3.1, 1.2)$      | } | 3 |
| 95.  | $(2.2) = f(3.1, 1.2, 0.2)$ |   |   |
| 96.  | $(2.2) = f(3.1, 1.2, 0.3)$ |   |   |
| 97.  | $(2.2) = f(3.1, 1.3)$      | } | 3 |
| 98.  | $(2.2) = f(3.1, 1.3, 0.3)$ |   |   |
| 99.  | $(2.2) = f(3.1, 1.3, 3.0)$ |   |   |
| 100. | $(2.2) = f(3.1, 2.3)$      | } | 2 |
| 101. | $(2.2) = f(3.1, 2.3, 3.0)$ |   |   |
| 102. | $(2.2) = f(3.1, 3.0)$      | } | 3 |
| 103. | $(2.2) = f(3.1, 3.0, 1.3)$ |   |   |
| 104. | $(2.2) = f(3.1, 3.0, 2.3)$ |   |   |
| 105. | $(2.2) = f(3.2, 0.2)$      | } | 2 |
| 106. | $(2.2) = f(3.2, 0.2, 1.2)$ |   |   |
| 107. | $(2.2) = f(3.2, 0.3)$      | } | 3 |
| 108. | $(2.2) = f(3.2, 0.3, 1.2)$ |   |   |
| 109. | $(2.2) = f(3.2, 0.3, 1.3)$ |   |   |
| 110. | $(2.2) = f(3.2, 1.2)$      | } | 3 |
| 111. | $(2.2) = f(3.2, 1.2, 0.2)$ |   |   |
| 112. | $(2.2) = f(3.2, 1.2, 0.3)$ |   |   |
| 113. | $(2.2) = f(3.2, 1.3)$      | } | 2 |
| 114. | $(2.2) = f(3.2, 1.3, 0.3)$ |   |   |

3.11. 74 Funktionen mit  $w = (2.3)$

- |     |                            |   |   |
|-----|----------------------------|---|---|
| 1.  | $(2.3) = f(0.3, 1.3)$      | } | 4 |
| 2.  | $(2.3) = f(0.3, 1.3, 3.1)$ |   |   |
| 3.  | $(2.3) = f(0.3, 1.3, 3.2)$ |   |   |
| 4.  | $(2.3) = f(0.3, 1.3, 3.3)$ |   |   |
| 5.  | $(2.3) = f(0.3, 3.1)$      | } | 2 |
| 6.  | $(2.3) = f(0.3, 3.1, 1.3)$ |   |   |
| 7.  | $(2.3) = f(0.3, 3.2)$      | } | 2 |
| 8.  | $(2.3) = f(0.3, 3.2, 1.3)$ |   |   |
| 9.  | $(2.3) = f(0.3, 3.3)$      | } | 2 |
| 10. | $(2.3) = f(0.3, 3.3, 1.3)$ |   |   |

|     |                            |   |   |
|-----|----------------------------|---|---|
| 11. | $(2.3) = f(1.3, 0.3)$      | } | 4 |
| 12. | $(2.3) = f(1.3, 0.3, 3.1)$ |   |   |
| 13. | $(2.3) = f(1.3, 0.3, 3.2)$ |   |   |
| 14. | $(2.3) = f(1.3, 0.3, 3.3)$ |   |   |
| 15. | $(2.3) = f(1.3, 3.1)$      | } | 2 |
| 16. | $(2.3) = f(1.3, 3.1, 0.3)$ |   |   |
| 17. | $(2.3) = f(1.3, 3.2)$      | } | 2 |
| 18. | $(2.3) = f(1.3, 3.2, 0.3)$ |   |   |
| 19. | $(2.3) = f(1.3, 3.3)$      | } | 2 |
| 20. | $(2.3) = f(1.3, 3.3, 0.3)$ |   |   |
| 21. | $(2.3) = f(2.0, 2.1)$      | } | 2 |
| 22. | $(2.3) = f(2.0, 2.1, 2.2)$ |   |   |
| 23. | $(2.3) = f(2.0, 2.2)$      | } | 2 |
| 24. | $(2.3) = f(2.0, 2.2, 2.1)$ |   |   |
| 25. | $(2.3) = f(2.1, 2.0)$      | } | 2 |
| 26. | $(2.3) = f(2.1, 2.0, 2.2)$ |   |   |
| 27. | $(2.3) = f(2.1, 2.2)$      | } | 3 |
| 28. | $(2.3) = f(2.1, 2.2, 2.0)$ |   |   |
| 29. | $(2.3) = f(2.1, 2.2, 3.0)$ |   |   |
| 30. | $(2.3) = f(2.1, 3.0)$      | } | 2 |
| 31. | $(2.3) = f(2.1, 3.0, 2.2)$ |   |   |
| 32. | $(2.3) = f(2.2, 2.0)$      | } | 2 |
| 33. | $(2.3) = f(2.2, 2.0, 2.1)$ |   |   |
| 34. | $(2.3) = f(2.2, 2.1)$      | } | 3 |
| 35. | $(2.3) = f(2.2, 2.1, 2.0)$ |   |   |
| 36. | $(2.3) = f(2.2, 2.1, 3.0)$ |   |   |
| 37. | $(2.3) = f(2.2, 3.0)$      | } | 3 |
| 38. | $(2.3) = f(2.2, 3.0, 2.1)$ |   |   |
| 39. | $(2.3) = f(2.2, 3.0, 3.1)$ |   |   |
| 40. | $(2.3) = f(2.2, 3.1)$      | } | 2 |
| 41. | $(2.3) = f(2.2, 3.1, 3.0)$ |   |   |
| 42. | $(2.3) = f(3.0, 2.1)$      | } | 2 |
| 43. | $(2.3) = f(3.0, 2.1, 2.2)$ |   |   |
| 44. | $(2.3) = f(3.0, 2.2)$      | } | 3 |
| 45. | $(2.3) = f(3.0, 2.2, 2.1)$ |   |   |
| 46. | $(2.3) = f(3.0, 2.2, 3.1)$ |   |   |
| 47. | $(2.3) = f(3.0, 3.1)$      | } | 3 |
| 48. | $(2.3) = f(3.0, 3.1, 2.2)$ |   |   |
| 49. | $(2.3) = f(3.0, 3.1, 3.2)$ |   |   |
| 50. | $(2.3) = f(3.0, 3.2)$      | } | 2 |
| 51. | $(2.3) = f(3.0, 3.2, 3.1)$ |   |   |
| 52. | $(2.3) = f(3.1, 0.3)$      | } | 2 |
| 53. | $(2.3) = f(3.1, 0.3, 1.3)$ |   |   |
| 54. | $(2.3) = f(3.1, 1.3)$      | } | 2 |
| 55. | $(2.3) = f(3.1, 1.3, 0.3)$ |   |   |
| 56. | $(2.3) = f(3.1, 2.2)$      | } | 2 |
| 57. | $(2.3) = f(3.1, 2.2, 3.0)$ |   |   |

|     |                            |   |   |
|-----|----------------------------|---|---|
| 58. | $(2.3) = f(3.1, 3.0)$      | } | 3 |
| 59. | $(2.3) = f(3.1, 3.0, 2.2)$ |   |   |
| 60. | $(2.3) = f(3.1, 3.0, 3.2)$ | } | 2 |
| 61. | $(2.3) = f(3.1, 3.2)$      |   |   |
| 62. | $(2.3) = f(3.1, 3.2, 3.0)$ | } | 2 |
| 63. | $(2.3) = f(3.2, 0.3)$      |   |   |
| 64. | $(2.3) = f(3.2, 0.3, 1.3)$ | } | 2 |
| 65. | $(2.3) = f(3.2, 1.3)$      |   |   |
| 66. | $(2.3) = f(3.2, 1.3, 0.3)$ | } | 2 |
| 67. | $(2.3) = f(3.2, 3.0)$      |   |   |
| 68. | $(2.3) = f(3.2, 3.0, 3.1)$ | } | 2 |
| 69. | $(2.3) = f(3.2, 3.1)$      |   |   |
| 70. | $(2.3) = f(3.2, 3.1, 3.0)$ | } | 2 |
| 71. | $(2.3) = f(3.3, 0.3)$      |   |   |
| 72. | $(2.3) = f(3.3, 0.3, 1.3)$ | } | 2 |
| 73. | $(2.3) = f(3.3, 1.3)$      |   |   |
| 74. | $(2.3) = f(3.3, 1.3, 0.3)$ | } | 2 |

3.12. 92 Funktionen mit  $w = (3.0)$

|     |                            |   |   |
|-----|----------------------------|---|---|
| 1.  | $(3.0) = f(1.1, 1.2)$      | } | 2 |
| 2.  | $(3.0) = f(1.1, 1.2, 1.3)$ |   |   |
| 3.  | $(3.0) = f(1.1, 1.3)$      | } | 2 |
| 4.  | $(3.0) = f(1.1, 1.3, 1.2)$ |   |   |
| 5.  | $(3.0) = f(1.2, 1.1)$      | } | 2 |
| 6.  | $(3.0) = f(1.2, 1.1, 1.3)$ |   |   |
| 7.  | $(3.0) = f(1.2, 1.3)$      | } | 4 |
| 8.  | $(3.0) = f(1.2, 1.3, 1.1)$ |   |   |
| 9.  | $(3.0) = f(1.2, 1.3, 2.1)$ | } | 2 |
| 10. | $(3.0) = f(1.2, 1.3, 3.1)$ |   |   |
| 11. | $(3.0) = f(1.2, 2.1)$      | } | 2 |
| 12. | $(3.0) = f(1.2, 2.1, 1.3)$ |   |   |
| 13. | $(3.0) = f(1.2, 3.1)$      | } | 2 |
| 14. | $(3.0) = f(1.2, 3.1, 1.3)$ |   |   |
| 15. | $(3.0) = f(1.3, 1.1)$      | } | 2 |
| 16. | $(3.0) = f(1.3, 1.1, 1.2)$ |   |   |
| 17. | $(3.0) = f(1.3, 1.2)$      | } | 4 |
| 18. | $(3.0) = f(1.3, 1.2, 1.1)$ |   |   |
| 19. | $(3.0) = f(1.3, 1.2, 2.1)$ | } | 3 |
| 20. | $(3.0) = f(1.3, 1.2, 3.1)$ |   |   |
| 21. | $(3.0) = f(1.3, 2.1)$      | } | 3 |
| 22. | $(3.0) = f(1.3, 2.1, 1.2)$ |   |   |
| 23. | $(3.0) = f(1.3, 2.1, 2.2)$ | } | 3 |
| 24. | $(3.0) = f(1.3, 2.2)$      |   |   |
| 25. | $(3.0) = f(1.3, 2.2, 2.1)$ | } | 3 |
| 26. | $(3.0) = f(1.3, 2.2, 3.1)$ |   |   |

|     |                            |   |   |
|-----|----------------------------|---|---|
| 27. | $(3.0) = f(1.3, 3.1)$      | } | 4 |
| 28. | $(3.0) = f(1.3, 3.1, 1.2)$ |   |   |
| 29. | $(3.0) = f(1.3, 3.1, 2.2)$ | } | 2 |
| 30. | $(3.0) = f(1.3, 3.1, 3.2)$ |   |   |
| 31. | $(3.0) = f(1.3, 3.2)$      | } | 2 |
| 32. | $(3.0) = f(1.3, 3.2, 3.1)$ |   |   |
| 33. | $(3.0) = f(2.1, 1.2)$      | } | 3 |
| 34. | $(3.0) = f(2.1, 1.2, 1.3)$ |   |   |
| 35. | $(3.0) = f(2.1, 1.3)$      | } | 3 |
| 36. | $(3.0) = f(2.1, 1.3, 1.2)$ |   |   |
| 37. | $(3.0) = f(2.1, 1.3, 2.2)$ | } | 3 |
| 38. | $(3.0) = f(2.1, 2.2)$      |   |   |
| 39. | $(3.0) = f(2.1, 2.2, 1.3)$ | } | 2 |
| 40. | $(3.0) = f(2.1, 2.2, 2.3)$ |   |   |
| 41. | $(3.0) = f(2.1, 2.3)$      | } | 3 |
| 42. | $(3.0) = f(2.1, 2.3, 2.2)$ |   |   |
| 43. | $(3.0) = f(2.2, 1.3)$      | } | 3 |
| 44. | $(3.0) = f(2.2, 1.3, 2.1)$ |   |   |
| 45. | $(3.0) = f(2.2, 1.3, 3.1)$ | } | 3 |
| 46. | $(3.0) = f(2.2, 2.1)$      |   |   |
| 47. | $(3.0) = f(2.2, 2.1, 1.3)$ | } | 3 |
| 48. | $(3.0) = f(2.2, 2.1, 2.3)$ |   |   |
| 49. | $(3.0) = f(2.2, 2.3)$      | } | 3 |
| 50. | $(3.0) = f(2.2, 2.3, 2.1)$ |   |   |
| 51. | $(3.0) = f(2.2, 2.3, 3.1)$ | } | 3 |
| 52. | $(3.0) = f(2.2, 3.1)$      |   |   |
| 53. | $(3.0) = f(2.2, 3.1, 1.3)$ | } | 2 |
| 54. | $(3.0) = f(2.2, 3.1, 2.3)$ |   |   |
| 55. | $(3.0) = f(2.3, 2.1)$      | } | 3 |
| 56. | $(3.0) = f(2.3, 2.1, 2.2)$ |   |   |
| 57. | $(3.0) = f(2.3, 2.2)$      | } | 3 |
| 58. | $(3.0) = f(2.3, 2.2, 2.1)$ |   |   |
| 59. | $(3.0) = f(2.3, 2.2, 3.1)$ | } | 3 |
| 60. | $(3.0) = f(2.3, 3.1)$      |   |   |
| 61. | $(3.0) = f(2.3, 3.1, 2.2)$ | } | 2 |
| 62. | $(3.0) = f(2.3, 3.1, 3.2)$ |   |   |
| 63. | $(3.0) = f(2.3, 3.2)$      | } | 4 |
| 64. | $(3.0) = f(2.3, 3.2, 3.1)$ |   |   |
| 65. | $(3.0) = f(3.1, 1.2)$      | } | 3 |
| 66. | $(3.0) = f(3.1, 1.2, 1.3)$ |   |   |
| 67. | $(3.0) = f(3.1, 1.3)$      | } | 2 |
| 68. | $(3.0) = f(3.1, 1.3, 1.2)$ |   |   |
| 69. | $(3.0) = f(3.1, 1.3, 2.2)$ | } | 3 |
| 70. | $(3.0) = f(3.1, 1.3, 3.2)$ |   |   |
| 71. | $(3.0) = f(3.1, 2.2)$      | } | 4 |
| 72. | $(3.0) = f(3.1, 2.2, 1.3)$ |   |   |
| 73. | $(3.0) = f(3.1, 2.2, 2.3)$ |   |   |

- |     |                            |   |   |
|-----|----------------------------|---|---|
| 74. | $(3.0) = f(3.1, 2.3)$      | } | 3 |
| 75. | $(3.0) = f(3.1, 2.3, 2.2)$ |   |   |
| 76. | $(3.0) = f(3.1, 2.3, 3.2)$ | } | 4 |
| 77. | $(3.0) = f(3.1, 3.2)$      |   |   |
| 78. | $(3.0) = f(3.1, 3.2, 1.3)$ | } | 4 |
| 79. | $(3.0) = f(3.1, 3.2, 2.3)$ |   |   |
| 80. | $(3.0) = f(3.1, 3.2, 3.3)$ | } | 2 |
| 81. | $(3.0) = f(3.2, 1.3)$      |   |   |
| 82. | $(3.0) = f(3.2, 1.3, 3.1)$ | } | 3 |
| 83. | $(3.0) = f(3.2, 2.3)$      |   |   |
| 84. | $(3.0) = f(3.2, 2.3, 3.1)$ | } | 4 |
| 85. | $(3.0) = f(3.2, 3.1, 1.3)$ |   |   |
| 86. | $(3.0) = f(3.2, 3.1)$      | } | 3 |
| 87. | $(3.0) = f(3.2, 3.1, 2.3)$ |   |   |
| 88. | $(3.0) = f(3.2, 3.1, 3.3)$ | } | 4 |
| 89. | $(3.0) = f(3.2, 3.3, 3.1)$ |   |   |
| 90. | $(3.0) = f(3.3, 3.1)$      | } | 3 |
| 91. | $(3.0) = f(3.3, 3.1, 3.2)$ |   |   |
| 92. | $(3.0) = f(3.3, 3.2, 3.1)$ | } | 3 |

3.13. 154 Funktionen mit  $w = (3.1)$

- |     |                            |   |   |
|-----|----------------------------|---|---|
| 1.  | $(3.1) = f(0.1, 1.1)$      | } | 2 |
| 2.  | $(3.1) = f(0.1, 1.1, 2.1)$ |   |   |
| 3.  | $(3.1) = f(0.1, 2.1)$      | } | 2 |
| 4.  | $(3.1) = f(0.1, 2.1, 1.1)$ |   |   |
| 5.  | $(3.1) = f(0.2, 1.1)$      | } | 2 |
| 6.  | $(3.1) = f(0.2, 1.1, 2.1)$ |   |   |
| 7.  | $(3.1) = f(0.2, 1.2)$      | } | 3 |
| 8.  | $(3.1) = f(0.2, 1.2, 2.1)$ |   |   |
| 9.  | $(3.1) = f(0.2, 1.2, 2.2)$ | } | 3 |
| 10. | $(3.1) = f(0.2, 2.1)$      |   |   |
| 11. | $(3.1) = f(0.2, 2.1, 1.1)$ | } | 2 |
| 12. | $(3.1) = f(0.2, 2.1, 1.2)$ |   |   |
| 13. | $(3.1) = f(0.2, 2.2)$      | } | 3 |
| 14. | $(3.1) = f(0.2, 2.2, 1.2)$ |   |   |
| 15. | $(3.1) = f(0.3, 1.1)$      | } | 2 |
| 16. | $(3.1) = f(0.3, 1.1, 2.1)$ |   |   |
| 17. | $(3.1) = f(0.3, 1.2)$      | } | 3 |
| 18. | $(3.1) = f(0.3, 1.2, 2.1)$ |   |   |
| 19. | $(3.1) = f(0.3, 1.2, 2.2)$ | } | 4 |
| 20. | $(3.1) = f(0.3, 1.3)$      |   |   |
| 21. | $(3.1) = f(0.3, 1.3, 2.1)$ | } | 4 |
| 22. | $(3.1) = f(0.3, 1.3, 2.2)$ |   |   |
| 23. | $(3.1) = f(0.3, 1.3, 2.3)$ | } | 4 |

|     |                            |   |   |
|-----|----------------------------|---|---|
| 24. | $(3.1) = f(0.3, 2.1)$      | } | 4 |
| 25. | $(3.1) = f(0.3, 2.1, 1.1)$ |   |   |
| 26. | $(3.1) = f(0.3, 2.1, 1.2)$ |   |   |
| 27. | $(3.1) = f(0.3, 2.1, 1.3)$ |   |   |
| 28. | $(3.1) = f(0.3, 2.2)$      | } | 3 |
| 29. | $(3.1) = f(0.3, 2.2, 1.2)$ |   |   |
| 30. | $(3.1) = f(0.3, 2.2, 1.3)$ |   |   |
| 31. | $(3.1) = f(0.3, 2.3)$      | } | 2 |
| 32. | $(3.1) = f(0.3, 2.3, 1.3)$ |   |   |
| 33. | $(3.1) = f(1.1, 0.1)$      | } | 2 |
| 34. | $(3.1) = f(1.1, 0.1, 2.1)$ |   |   |
| 35. | $(3.1) = f(1.1, 0.2)$      | } | 2 |
| 36. | $(3.1) = f(1.1, 0.2, 2.1)$ |   |   |
| 37. | $(3.1) = f(1.1, 0.3)$      | } | 2 |
| 38. | $(3.1) = f(1.1, 0.3, 2.1)$ |   |   |
| 39. | $(3.1) = f(1.1, 2.1)$      | } | 4 |
| 40. | $(3.1) = f(1.1, 2.1, 0.1)$ |   |   |
| 41. | $(3.1) = f(1.1, 2.1, 0.2)$ |   |   |
| 42. | $(3.1) = f(1.1, 2.1, 0.3)$ |   |   |
| 43. | $(3.1) = f(1.2, 0.2)$      | } | 3 |
| 44. | $(3.1) = f(1.2, 0.2, 2.1)$ |   |   |
| 45. | $(3.1) = f(1.2, 0.2, 2.2)$ |   |   |
| 46. | $(3.1) = f(1.2, 0.3)$      | } | 3 |
| 47. | $(3.1) = f(1.2, 0.3, 2.1)$ |   |   |
| 48. | $(3.1) = f(1.2, 0.3, 2.2)$ |   |   |
| 49. | $(3.1) = f(1.2, 1.3)$      | } | 2 |
| 50. | $(3.1) = f(1.2, 1.3, 3.0)$ |   |   |
| 51. | $(3.1) = f(1.2, 2.1)$      | } | 3 |
| 52. | $(3.1) = f(1.2, 2.1, 0.2)$ |   |   |
| 53. | $(3.1) = f(1.2, 2.1, 0.3)$ |   |   |
| 54. | $(3.1) = f(1.2, 2.2)$      | } | 3 |
| 55. | $(3.1) = f(1.2, 2.2, 0.2)$ |   |   |
| 56. | $(3.1) = f(1.2, 2.2, 0.3)$ |   |   |
| 57. | $(3.1) = f(1.2, 3.0)$      | } | 2 |
| 58. | $(3.1) = f(1.2, 3.0, 1.3)$ |   |   |
| 59. | $(3.1) = f(1.3, 0.3)$      | } | 4 |
| 60. | $(3.1) = f(1.3, 0.3, 2.1)$ |   |   |
| 61. | $(3.1) = f(1.3, 0.3, 2.2)$ |   |   |
| 62. | $(3.1) = f(1.3, 0.3, 2.3)$ |   |   |
| 63. | $(3.1) = f(1.3, 1.2)$      | } | 2 |
| 64. | $(3.1) = f(1.3, 1.2, 3.0)$ |   |   |
| 65. | $(3.1) = f(1.3, 2.1)$      | } | 2 |
| 66. | $(3.1) = f(1.3, 2.1, 0.3)$ |   |   |
| 67. | $(3.1) = f(1.3, 2.2)$      | } | 3 |
| 68. | $(3.1) = f(1.3, 2.2, 0.3)$ |   |   |
| 69. | $(3.1) = f(1.3, 2.2, 3.0)$ |   |   |
| 70. | $(3.1) = f(1.3, 2.3)$      | } | 2 |
| 71. | $(3.1) = f(1.3, 2.3, 0.3)$ |   |   |



|      |                            |   |   |
|------|----------------------------|---|---|
| 72.  | $(3.1) = f(1.3, 3.0)$      | } | 4 |
| 73.  | $(3.1) = f(1.3, 3.0, 1.2)$ |   |   |
| 74.  | $(3.1) = f(1.3, 3.0, 2.2)$ |   |   |
| 75.  | $(3.1) = f(1.3, 3.0, 3.2)$ |   |   |
| 76.  | $(3.1) = f(1.3, 3.2)$      | } | 2 |
| 77.  | $(3.1) = f(1.3, 3.2, 3.0)$ |   |   |
| 78.  | $(3.1) = f(2.1, 0.1)$      | } | 2 |
| 79.  | $(3.1) = f(2.1, 0.1, 1.1)$ |   |   |
| 80.  | $(3.1) = f(2.1, 0.2)$      | } | 3 |
| 81.  | $(3.1) = f(2.1, 0.2, 1.1)$ |   |   |
| 82.  | $(3.1) = f(2.1, 0.2, 1.2)$ |   |   |
| 83.  | $(3.1) = f(2.1, 0.3)$      | } | 4 |
| 84.  | $(3.1) = f(2.1, 0.3, 1.1)$ |   |   |
| 85.  | $(3.1) = f(2.1, 0.3, 1.2)$ |   |   |
| 86.  | $(3.1) = f(2.1, 0.3, 1.3)$ |   |   |
| 87.  | $(3.1) = f(2.1, 1.1)$      | } | 4 |
| 88.  | $(3.1) = f(2.1, 1.1, 0.1)$ |   |   |
| 89.  | $(3.1) = f(2.1, 1.1, 0.2)$ |   |   |
| 90.  | $(3.1) = f(2.1, 1.1, 0.3)$ |   |   |
| 91.  | $(3.1) = f(2.1, 1.2)$      | } | 3 |
| 92.  | $(3.1) = f(2.1, 1.2, 0.2)$ |   |   |
| 93.  | $(3.1) = f(2.1, 1.2, 0.3)$ |   |   |
| 94.  | $(3.1) = f(2.1, 1.3)$      | } | 2 |
| 95.  | $(3.1) = f(2.1, 1.3, 0.3)$ |   |   |
| 96.  | $(3.1) = f(2.2, 0.2)$      | } | 2 |
| 97.  | $(3.1) = f(2.2, 0.2, 1.2)$ |   |   |
| 98.  | $(3.1) = f(2.2, 0.3)$      | } | 3 |
| 99.  | $(3.1) = f(2.2, 0.3, 1.2)$ |   |   |
| 100. | $(3.1) = f(2.2, 0.3, 1.3)$ |   |   |
| 101. | $(3.1) = f(2.2, 1.2)$      | } | 3 |
| 102. | $(3.1) = f(2.2, 1.2, 0.2)$ |   |   |
| 103. | $(3.1) = f(2.2, 1.2, 0.3)$ |   |   |
| 104. | $(3.1) = f(2.2, 1.3)$      | } | 3 |
| 105. | $(3.1) = f(2.2, 1.3, 0.3)$ |   |   |
| 106. | $(3.1) = f(2.2, 1.3, 3.0)$ |   |   |
| 107. | $(3.1) = f(2.2, 2.3)$      | } | 2 |
| 108. | $(3.1) = f(2.2, 2.3, 3.0)$ |   |   |
| 109. | $(3.1) = f(2.2, 3.0)$      | } | 3 |
| 110. | $(3.1) = f(2.2, 3.0, 1.3)$ |   |   |
| 111. | $(3.1) = f(2.2, 3.0, 2.3)$ |   |   |
| 112. | $(3.1) = f(2.3, 0.3)$      | } | 2 |
| 113. | $(3.1) = f(2.3, 0.3, 1.3)$ |   |   |
| 114. | $(3.1) = f(2.3, 1.3)$      | } | 2 |
| 115. | $(3.1) = f(2.3, 1.3, 0.3)$ |   |   |
| 116. | $(3.1) = f(2.3, 2.2)$      | } | 2 |
| 117. | $(3.1) = f(2.3, 2.2, 3.0)$ |   |   |

- |      |                            |   |   |
|------|----------------------------|---|---|
| 118. | $(3.1) = f(2.3, 3.0)$      | } | 3 |
| 119. | $(3.1) = f(2.3, 3.0, 2.2)$ |   |   |
| 120. | $(3.1) = f(2.3, 3.0, 3.2)$ | } | 2 |
| 121. | $(3.1) = f(2.3, 3.2)$      |   |   |
| 122. | $(3.1) = f(2.3, 3.2, 3.0)$ | } | 2 |
| 123. | $(3.1) = f(3.0, 1.2)$      |   |   |
| 124. | $(3.1) = f(3.0, 1.2, 1.3)$ | } | 4 |
| 125. | $(3.1) = f(3.0, 1.3)$      |   |   |
| 126. | $(3.1) = f(3.0, 1.3, 1.2)$ | } | 3 |
| 127. | $(3.1) = f(3.0, 1.3, 2.2)$ |   |   |
| 128. | $(3.1) = f(3.0, 1.3, 3.2)$ | } | 3 |
| 129. | $(3.1) = f(3.0, 2.2)$      |   |   |
| 130. | $(3.1) = f(3.0, 2.2, 1.3)$ | } | 3 |
| 131. | $(3.1) = f(3.0, 2.2, 2.3)$ |   |   |
| 132. | $(3.1) = f(3.0, 2.3)$      | } | 3 |
| 133. | $(3.1) = f(3.0, 2.3, 2.2)$ |   |   |
| 134. | $(3.1) = f(3.0, 2.3, 3.2)$ | } | 4 |
| 135. | $(3.1) = f(3.0, 3.2)$      |   |   |
| 136. | $(3.1) = f(3.0, 3.2, 1.3)$ | } | 4 |
| 137. | $(3.1) = f(3.0, 3.2, 2.3)$ |   |   |
| 138. | $(3.1) = f(3.0, 3.2, 3.3)$ | } | 2 |
| 139. | $(3.1) = f(3.0, 3.3)$      |   |   |
| 140. | $(3.1) = f(3.0, 3.3, 3.2)$ | } | 2 |
| 141. | $(3.1) = f(3.2, 1.3)$      |   |   |
| 142. | $(3.1) = f(3.2, 1.3, 3.0)$ | } | 2 |
| 143. | $(3.1) = f(3.2, 2.3)$      |   |   |
| 144. | $(3.1) = f(3.2, 2.3, 3.0)$ | } | 2 |
| 145. | $(3.1) = f(3.2, 3.0)$      |   |   |
| 146. | $(3.1) = f(3.2, 3.0, 1.3)$ | } | 4 |
| 147. | $(3.1) = f(3.2, 3.0, 2.3)$ |   |   |
| 148. | $(3.1) = f(3.2, 3.0, 3.3)$ | } | 2 |
| 149. | $(3.1) = f(3.2, 3.3)$      |   |   |
| 150. | $(3.1) = f(3.2, 3.3, 3.0)$ | } | 2 |
| 151. | $(3.1) = f(3.3, 3.0)$      |   |   |
| 152. | $(3.1) = f(3.3, 3.0, 3.2)$ | } | 2 |
| 153. | $(3.1) = f(3.3, 3.2)$      |   |   |
| 154. | $(3.1) = f(3.3, 3.2, 3.0)$ | } | 2 |

3.14. 74 Funktionen mit  $w = (3.2)$

- |    |                            |   |   |
|----|----------------------------|---|---|
| 1. | $(3.2) = f(0.2, 1.2)$      | } | 2 |
| 2. | $(3.2) = f(0.2, 1.2, 2.2)$ |   |   |
| 3. | $(3.2) = f(0.2, 2.2)$      | } | 2 |
| 4. | $(3.2) = f(0.2, 2.2, 1.2)$ |   |   |
| 5. | $(3.2) = f(0.3, 1.2)$      | } | 2 |
| 6. | $(3.2) = f(0.3, 1.2, 2.2)$ |   |   |

- |     |                            |   |   |
|-----|----------------------------|---|---|
| 7.  | $(3.2) = f(0.3, 1.3)$      | } | 3 |
| 8.  | $(3.2) = f(0.3, 1.3, 2.2)$ |   |   |
| 9.  | $(3.2) = f(0.3, 1.3, 2.3)$ |   |   |
| 10. | $(3.2) = f(0.3, 2.2)$      | } | 3 |
| 11. | $(3.2) = f(0.3, 2.2, 1.2)$ |   |   |
| 12. | $(3.2) = f(0.3, 2.2, 1.3)$ |   |   |
| 13. | $(3.2) = f(0.3, 2.3)$      | } | 2 |
| 14. | $(3.2) = f(0.3, 2.3, 1.3)$ |   |   |
| 15. | $(3.2) = f(1.2, 0.2)$      | } | 2 |
| 16. | $(3.2) = f(1.2, 0.2, 2.2)$ |   |   |
| 17. | $(3.2) = f(1.2, 0.3)$      | } | 2 |
| 18. | $(3.2) = f(1.2, 0.3, 2.2)$ |   |   |
| 19. | $(3.2) = f(1.2, 2.2)$      | } | 3 |
| 20. | $(3.2) = f(1.2, 2.2, 0.2)$ |   |   |
| 21. | $(3.2) = f(1.2, 2.2, 0.3)$ |   |   |
| 22. | $(3.2) = f(1.3, 0.3)$      | } | 3 |
| 23. | $(3.2) = f(1.3, 0.3, 2.2)$ |   |   |
| 24. | $(3.2) = f(1.3, 0.3, 2.3)$ |   |   |
| 25. | $(3.2) = f(1.3, 2.2)$      | } | 2 |
| 26. | $(3.2) = f(1.3, 2.2, 0.3)$ |   |   |
| 27. | $(3.2) = f(1.3, 2.3)$      | } | 2 |
| 28. | $(3.2) = f(1.3, 2.3, 0.3)$ |   |   |
| 29. | $(3.2) = f(1.3, 3.0)$      | } | 2 |
| 30. | $(3.2) = f(1.3, 3.0, 3.1)$ |   |   |
| 31. | $(3.2) = f(1.3, 3.1)$      | } | 2 |
| 32. | $(3.2) = f(1.3, 3.1, 3.0)$ |   |   |
| 33. | $(3.2) = f(2.2, 0.2)$      | } | 2 |
| 34. | $(3.2) = f(2.2, 0.2, 1.2)$ |   |   |
| 35. | $(3.2) = f(2.2, 0.3)$      | } | 3 |
| 36. | $(3.2) = f(2.2, 0.3, 1.2)$ |   |   |
| 37. | $(3.2) = f(2.2, 0.3, 1.3)$ |   |   |
| 38. | $(3.2) = f(2.2, 1.2)$      | } | 3 |
| 39. | $(3.2) = f(2.2, 1.2, 0.2)$ |   |   |
| 40. | $(3.2) = f(2.2, 1.2, 0.3)$ |   |   |
| 41. | $(3.2) = f(2.2, 1.3)$      | } | 2 |
| 42. | $(3.2) = f(2.2, 1.3, 0.3)$ |   |   |
| 43. | $(3.2) = f(2.3, 0.3)$      | } | 2 |
| 44. | $(3.2) = f(2.3, 0.3, 1.3)$ |   |   |
| 45. | $(3.2) = f(2.3, 1.3)$      | } | 2 |
| 46. | $(3.2) = f(2.3, 1.3, 0.3)$ |   |   |
| 47. | $(3.2) = f(2.3, 3.0)$      | } | 2 |
| 48. | $(3.2) = f(2.3, 3.0, 3.1)$ |   |   |
| 49. | $(3.2) = f(2.3, 3.1)$      | } | 2 |
| 50. | $(3.2) = f(2.3, 3.1, 3.0)$ |   |   |
| 51. | $(3.2) = f(3.0, 1.3)$      | } | 2 |
| 52. | $(3.2) = f(3.0, 1.3, 3.1)$ |   |   |
| 53. | $(3.2) = f(3.0, 2.3)$      | } | 2 |
| 54. | $(3.2) = f(3.0, 2.3, 3.1)$ |   |   |

- |     |                            |   |   |
|-----|----------------------------|---|---|
| 55. | $(3.2) = f(3.0, 3.1)$      | } | 4 |
| 56. | $(3.2) = f(3.0, 3.1, 1.3)$ |   |   |
| 57. | $(3.2) = f(3.0, 3.1, 2.3)$ |   |   |
| 58. | $(3.2) = f(3.0, 3.1, 3.3)$ |   |   |
| 59. | $(3.2) = f(3.0, 3.3)$      | } | 2 |
| 60. | $(3.2) = f(3.0, 3.3, 3.1)$ |   |   |
| 61. | $(3.2) = f(3.1, 1.3)$      | } | 2 |
| 62. | $(3.2) = f(3.1, 1.3, 3.0)$ |   |   |
| 63. | $(3.2) = f(3.1, 2.3)$      | } | 2 |
| 64. | $(3.2) = f(3.1, 2.3, 3.0)$ |   |   |
| 65. | $(3.2) = f(3.1, 3.0)$      | } | 4 |
| 66. | $(3.2) = f(3.1, 3.0, 1.3)$ |   |   |
| 67. | $(3.2) = f(3.1, 3.0, 2.3)$ |   |   |
| 68. | $(3.2) = f(3.1, 3.0, 3.3)$ |   |   |
| 69. | $(3.2) = f(3.1, 3.3)$      | } | 2 |
| 70. | $(3.2) = f(3.1, 3.3, 3.0)$ |   |   |
| 71. | $(3.2) = f(3.3, 3.0)$      | } | 2 |
| 72. | $(3.2) = f(3.3, 3.0, 3.1)$ |   |   |
| 73. | $(3.2) = f(3.3, 3.1)$      | } | 2 |
| 74. | $(3.2) = f(3.3, 3.1, 3.0)$ |   |   |

3.15. 24 Funktionen mit  $w = (3.3)$

- |     |                            |   |   |
|-----|----------------------------|---|---|
| 1.  | $(3.3) = f(0.3, 1.3)$      | } | 2 |
| 2.  | $(3.3) = f(0.3, 1.3, 2.3)$ |   |   |
| 3.  | $(3.3) = f(0.3, 2.3)$      | } | 2 |
| 4.  | $(3.3) = f(0.3, 2.3, 1.3)$ |   |   |
| 5.  | $(3.3) = f(1.3, 0.3)$      | } | 2 |
| 6.  | $(3.3) = f(1.3, 0.3, 2.3)$ |   |   |
| 7.  | $(3.3) = f(1.3, 2.3)$      | } | 2 |
| 8.  | $(3.3) = f(1.3, 2.3, 0.3)$ |   |   |
| 9.  | $(3.3) = f(2.3, 0.3)$      | } | 2 |
| 10. | $(3.3) = f(2.3, 0.3, 1.3)$ |   |   |
| 11. | $(3.3) = f(2.3, 1.3)$      | } | 2 |
| 12. | $(3.3) = f(2.3, 1.3, 0.3)$ |   |   |
| 13. | $(3.3) = f(3.0, 3.1)$      | } | 2 |
| 14. | $(3.3) = f(3.0, 3.1, 3.2)$ |   |   |
| 15. | $(3.3) = f(3.0, 3.2)$      | } | 2 |
| 16. | $(3.3) = f(3.0, 3.2, 3.1)$ |   |   |
| 17. | $(3.3) = f(3.1, 3.0)$      | } | 2 |
| 18. | $(3.3) = f(3.1, 3.0, 3.2)$ |   |   |
| 19. | $(3.3) = f(3.1, 3.2)$      | } | 2 |
| 20. | $(3.3) = f(3.1, 3.2, 3.0)$ |   |   |
| 21. | $(3.3) = f(3.2, 3.0)$      | } | 2 |
| 22. | $(3.3) = f(3.2, 3.0, 3.1)$ |   |   |
| 23. | $(3.3) = f(3.2, 3.1)$      | } | 2 |
| 24. | $(3.3) = f(3.2, 3.1, 3.0)$ |   |   |

4.1. Wir haben somit

3.1. 12 Funktionen mit  $w = (0.1)$

3.2. 41 Funktionen mit  $w = (0.2)$

3.3. 92 Funktionen mit  $w = (0.3)$

3.4. 12 Funktionen mit  $w = (1.0)$

3.5. 64 Funktionen mit  $w = (1.1)$

3.6. 115 Funktionen mit  $w = (1.2)$

3.7. 152 Funktionen mit  $w = (1.3)$

3.8. 41 Funktionen mit  $w = (2.0)$

3.9. 116 Funktionen mit  $w = (2.1)$

3.10. 99 Funktionen mit  $w = (2.2)$

3.11. 74 Funktionen mit  $w = (2.3)$

3.12. 92 Funktionen mit  $w = (3.0)$

3.13. 154 Funktionen mit  $w = (3.1)$

3.14. 74 Funktionen mit  $w = (3.2)$

3.15. 24 Funktionen mit  $w = (3.3)$

4.2. Damit gehört also jede triadische polykontextural-semiotische Funktion zu einer tetradischen, oder, anders ausgedrückt: Partielle polykontextural-semiotische Funktion treten nicht isoliert auf, sondern in einer Familie, die von einer tetradischen polykontextural-semiotischen Funktion “angeführt” wird. Ob eine polykontextural-semiotische Funktion zu einer solchen “Funktionen-Familie” von 2, 3 oder 4 Mitgliedern gehört, bestimmt offensichtlich ganz einfach ihre Struktur, die in den obigen Listen freilich optisch durch die auftretenden Permutationen der “regulären” tetradischen Dualsysteme der abstrakten Form  $(3.a\ 2.b\ 1.c\ 0.d) \times (d.0\ c.1\ b.2\ a.3)$  etwas verdeckt ist:

$PZR = (3.a\ 2.b\ 1.c\ 0.d)$  mit  $a \leq b \leq c \leq d$ , wobei  $a, b, c, d \in \{.1, .2, .3\}$ .

Man bedenke, dass wir im realitätstheoretischen Falle also haben

$PZR^\circ = (d.0\ c.1\ b.2\ a.3)$ ,

wobei also wie im zeichentheoretischen Falle ( $PZR$ ) wegen des von Bense eingeführten Unterscheides zwischen kategorialen und relationalen Zahlen (Bense 1975, S. 65 f.)  $d \neq 0$  ist, was ja der Grund für die nicht-quadratische polykontextural-semiotische Matrix ist, denn die genuine, iterierte nullheitliche Kategorie “0.0” würde gerade dem durch die nicht-genuinen trichotomischen Kategorien  $(0.1)$ ,  $(0.2)$ ,  $(0.3)$  ausgedrückte Aufhebung der polykontexturalen Grenze zwischen Zeichen und Objekt widersprechen, insofern hier das kategoriale Objekt als “reines”, nicht “Zeichen-infiziertes” Objekt erschiene.

Mit anderen Worten: Ausgehend von

$PZR = (3.a\ 2.b\ 1.c\ 0.d)$  und  $PZR^\circ = (d.0\ c.1\ b.2\ a.3)$

finden wir in den Listen die folgenden  $2 \cdot 24$  Permutationen:

(3.a 2.b 1.c 0.d) × (d.0 c.1 b.2 a.3)  
 (2.b 3.a 1.c 0.d) × (d.0 c.1 a.3 b.2)  
 (2.b 1.c 3.a 0.d) × (d.0 a.3 c.1 b.2)  
 (1.c 2.b 3.a 0.d) × (d.0 a.3 b.2 c.1)  
 (3.a 1.c 2.b 0.d) × (d.0 b.2 c.1 a.3)  
 (1.c 3.a 2.b 0.d) × (d.0 b.2 a.3 c.1)

(2.b 3.a 0.d 1.c) × (c.1 d.0 a.3 b.2)  
 (3.a 2.b 0.d 1.c) × (c.1 d.0 b.2 a.3)  
 (2.b 1.c 0.d 3.a) × (a.3 d.0 c.1 b.2)  
 (1.c 2.b 0.d 3.a) × (a.3 d.0 b.2 c.1)  
 (3.a 1.c 0.d 2.b) × (b.2 d.0 c.1 a.3)  
 (1.c 3.a 0.d 2.b) × (b.2 d.0 a.3 c.1)

(2.b 0.d 3.a 1.c) × (c.1 a.3 d.0 b.2)  
 (3.a 0.d 2.b 1.c) × (c.1 b.2 d.0 a.3)  
 (2.b 0.d 1.c 3.a) × (a.3 c.1 d.0 b.2)  
 (1.c 0.d 2.b 3.a) × (a.3 b.2 d.0 c.1)  
 (3.a 0.d 1.c 2.b) × (b.2 c.1 d.0 a.3)  
 (1.c 0.d 3.a 2.b) × (b.2 a.3 d.0 c.1)

(0.d 2.b 3.a 1.c) × (c.1 a.3 b.2 d.0)  
 (0.d 3.a 2.b 1.c) × (c.1 b.2 a.3 d.0)  
 (0.d 1.c 2.b 3.a) × (a.3 b.2 c.1 d.0)  
 (0.d 2.b 1.c 3.a) × (a.3 c.1 b.2 d.0)  
 (0.d 3.a 1.c 2.b) × (b.2 c.1 a.3 d.0)  
 (0.d 1.c 3.a 2.b) × (b.2 a.3 c.1 d.0)

Wegen der trichotomischen Ordnung ( $a \leq b \leq c \leq d$ ) bestimmen also bei den partiellen Funktionen die “anwesenden” Funktionsglieder die “fehlenden”. Wir hatten diese “fehlenden” Funktionsglieder ja weiter oben als “übersprungene” Kategorien bezeichnet, weil sie im polykontexturalen Sinne in eindeutig-mehrmöglicher Weise durch die “anwesenden” Funktionsglieder bestimmt werden. Wenn wir etwa die Nr. 18 aus Liste 3.2. nehmen

$$(0.2) = f(2.1, 3.1),$$

dann hat also die vollständige tetradische Zeichenrelation die beiden möglichen Formen

$$(0.2) = f(2.1, 3.1 \ 1.c)$$

$$(0.2) = f(1.c, 2.1, 3.1).$$

Wegen (3.1 2.1) ergibt sich also  $c = 1$  oder  $c = 2$ , d.h. 2 Möglichkeiten

$$(0.2) = f(2.1, 3.1, 1.1) / (1.1, 2.1, 3.1)$$

$$(0.2) = f(2.1, 3.1, 1.2) / (1.2, 2.1, 3.1),$$

und die vor dem Schrägstrich stehenden Funktionen sind tatsächlich die Nrn. 19 und 20 in Liste 3.2.

Die 3er-Familie der polykontextural-semiotischen Funktionen

$$\text{Nr. 18 } (0.2) = f(2.1, 3.1)$$

$$\text{Nr. 19 } (0.2) = f(2.1, 3.1, 1.1)$$

$$\text{Nr. 20 } (0.2) = f(2.1, 3.1, 1.2)$$

besagt wegen der Äquivalenz der polykontextural-semiotischen Funktionen aber auch, dass diese gegenseitig ersetzbar sind. Man könnte also auch sagen, die triadische polykontextural-semiotische Funktion Nr. 18 impliziere eine doppelte Option ihrer Substitution. Da die tetradische Zeichenklasse der partiellen Funktion Nr. 18 nicht eindeutig rekonstruierbar ist, ergeben sich also bei einer Rekonstruktion die beiden Alternativen Nr. 19 und Nr. 20, d.h. zwei verschiedene tetradische Zeichenklassen, und, da das kategoriale Objekt (0.2) konstant ist, nach der Entfernung der Faserung auch zwei verschiedene triadische, d.h. monokontexturale Zeichenklassen.

4.3. Die 15 Listen mit ihren 1162 polykontextural-semiotischen Funktionen besagen also vor allem, dass die 15 polykontexturalen monadischen Subzeichen der tetradischen semiotischen Matrix durch total 1162 dyadische (partielle) und triadische polykontextural-semiotische Funktionen substituiert werden können, wobei jede "Familie" von Funktionen 2, 3 oder 4 Optionen hat. Der Anwendung dieser funktionalen Substitutionen wird eine eigene Arbeit gewidmet sein.

## **Bibliographie**

Bense, Max, Semiotische Prozesse und Systeme. Baden-Baden 1975

Toth, Alfred, Semiotische Strukturen und Prozesse. Klagenfurt 2008 (2008a)

Toth, Alfred, Entwurf einer handlungstheoretischen Semiotik. Klagenfurt 2008 (2008b)

©2008, Prof. Dr. Alfred Toth