

# Knotentheorie Alexanderpolynome

Literatur Seite 1

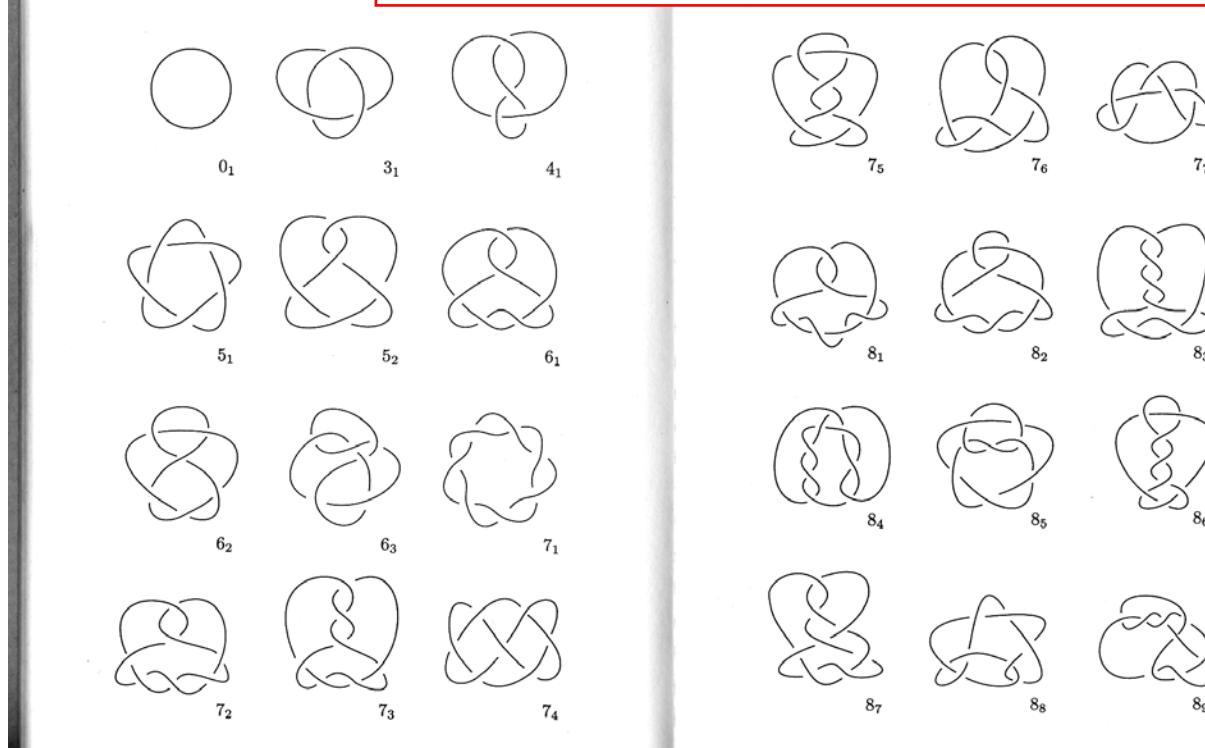
1.10.2018

## Anhang 1: Knotentafel

Seite 1 Knoten 0.1 bis 8.9, Alexanderpolynome 3.1 -8.6+9.37-9.49

Seiten 2+3 Alexanderpoynome 8.6-9.36

Seite 4 Knoten 8.10-9.12 + 9.37-9.49 + ANLEITUNG für Alexanderp.



$$3_1 \quad t^2 - t + 1$$

$$4_1 \quad t^2 - 3t + 1$$

$$5_1 \quad t^4 - t^3 + t^2 - t + 1$$

$$5_2 \quad 2t^2 - 3t + 2$$

$$6_1 \quad 2t^2 - 5t + 2$$

$$6_2 \quad t^4 - 3t^3 + 3t^2 - 3t + 1$$

$$6_3 \quad t^4 - 3t^3 + 5t^2 - 3t + 1$$

$$7_1 \quad t^6 - t^5 + t^4 - t^3 + t^2 - t + 1$$

$$7_2 \quad 3t^2 - 5t + 3$$

$$7_3 \quad 2t^4 - 3t^3 + 3t^2 - 3t + 2$$

$$7_4 \quad 4t^2 - 7t + 4$$

$$7_5 \quad 2t^4 - 4t^3 + 5t^2 - 4t + 2$$

$$7_6 \quad t^4 - 5t^3 + 7t^2 - 5t + 1$$

$$7_7 \quad t^4 - 5t^3 + 9t^2 - 5t + 1$$

$$8_1 \quad 3t^2 - 7t + 3$$

$$8_2 \quad t^6 - 3t^5 + 3t^4 - 3t^3 + 3t^2 - 3t + 1$$

$$8_3 \quad 4t^2 - 9t + 4$$

$$8_4 \quad 2t^4 - 5t^3 + 5t^2 - 5t + 2$$

$$8_5 \quad t^6 - 3t^5 + 4t^4 - 5t^3 + 4t^2 - 3t + 1$$

208

Anhang 2: Alexander-Polynome

$$9_{37} \quad 2t^4 - 11t^3 + 19t^2 - 11t + 2$$

$$9_{38} \quad 5t^4 - 14t^3 + 19t^2 - 14t + 5$$

$$9_{39} \quad 3t^4 - 14t^3 + 21t^2 - 14t + 3$$

$$9_{40} \quad t^6 - 7t^5 + 18t^4 - 23t^3 + 18t^2 - 7t + 1$$

$$9_{41} \quad 3t^4 - 12t^3 + 19t^2 - 12t + 3$$

$$9_{42} \quad t^4 - 2t^3 + t^2 - 2t + 1$$

$$9_{43} \quad t^6 - 3t^5 + 2t^4 - t^3 + 2t^2 - 3t + 1$$

$$9_{44} \quad t^4 - 4t^3 + 7t^2 - 4t + 1$$

$$9_{45} \quad t^4 - 6t^3 + 9t^2 - 6t + 1$$

$$9_{46} \quad 2t^2 - 5t + 2$$

$$9_{47} \quad t^6 - 4t^5 + 6t^4 - 5t^3 + 6t^2 - 4t + 1$$

$$9_{48} \quad t^4 - 7t^3 + 11t^2 - 7t + 1$$

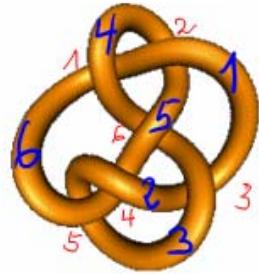
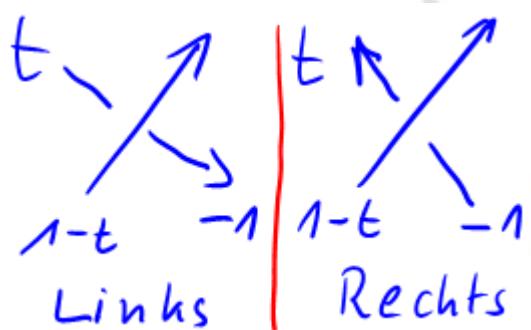
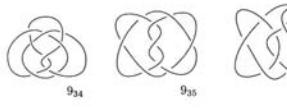
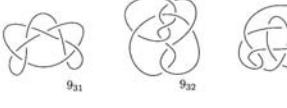
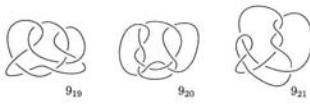
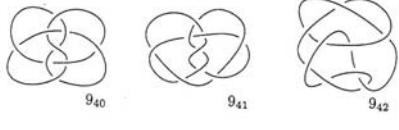
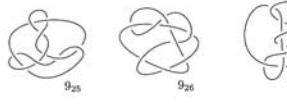
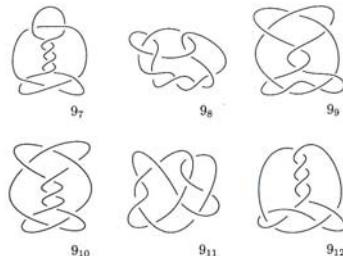
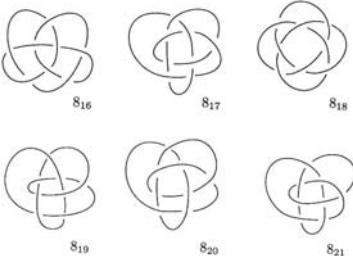
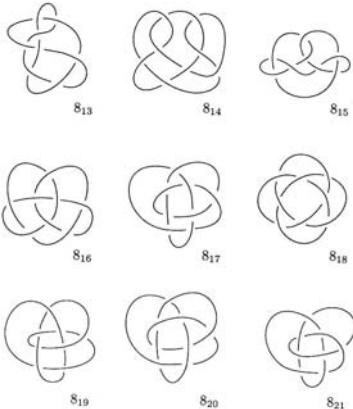
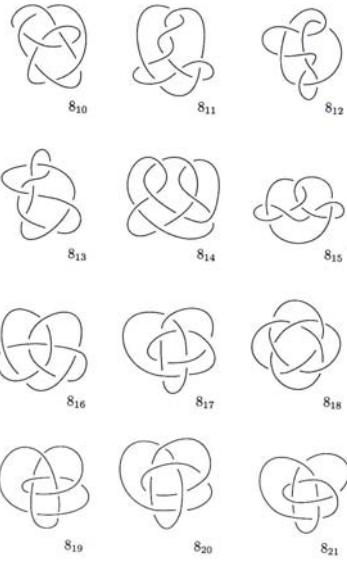
$$9_{49} \quad 3t^4 - 6t^3 + 7t^2 - 6t + 3$$

Charles Livingston  
Knotentheorie für Einsteiger  
Braunschweig 1995, Vieweg  
ISBN 3 528 06660 1

Alexei Sossinski  
Mathematik der Knoten  
rororo science sachbuch  
Hamburg, 2000  
ISBN 978 3499609305 (9€)

|                       |   |
|-----------------------|---|
| <b>8<sub>6</sub></b>  | $2t^4 - 6t^3 + 7t^2 - 6t + 2$                     |
| <b>8<sub>7</sub></b>  | $t^6 - 3t^5 + 5t^4 - 5t^3 + 5t^2 - 3t + 1$        |
| <b>8<sub>8</sub></b>  | $2t^4 - 6t^3 + 9t^2 - 6t + 2$                     |
| <b>8<sub>9</sub></b>  | $t^6 - 3t^5 + 5t^4 - 7t^3 + 5t^2 - 3t + 1$        |
| <b>8<sub>10</sub></b> | $t^6 - 3t^5 + 6t^4 - 7t^3 + 6t^2 - 3t + 1$        |
| <b>8<sub>11</sub></b> | $2t^4 - 7t^3 + 9t^2 - 7t + 2$                     |
| <b>8<sub>12</sub></b> | $t^4 - 7t^3 + 13t^2 - 7t + 1$                     |
| <b>8<sub>13</sub></b> | $2t^4 - 7t^3 + 11t^2 - 7t + 2$                    |
| <b>8<sub>14</sub></b> | $2t^4 - 8t^3 + 11t^2 - 8t + 2$                    |
| <b>8<sub>15</sub></b> | $3t^4 - 8t^3 + 11t^2 - 8t + 3$                    |
| <b>8<sub>16</sub></b> | $t^6 - 4t^5 + 8t^4 - 9t^3 + 8t^2 - 4t + 1$        |
| <b>8<sub>17</sub></b> | $t^6 - 4t^5 + 8t^4 - 11t^3 + 8t^2 - 4t + 1$       |
| <b>8<sub>18</sub></b> | $t^6 - 5t^5 + 10t^4 - 13t^3 + 10t^2 - 5t + 1$     |
| <b>8<sub>19</sub></b> | $t^6 - t^5 + t^3 - t + 1$                         |
| <b>8<sub>20</sub></b> | $t^4 - 2t^3 + 3t^2 - 2t + 1$                      |
| <b>8<sub>21</sub></b> | $t^4 - 4t^3 + 5t^2 - 4t + 1$                      |
| <b>9<sub>1</sub></b>  | $t^8 - t^7 + t^6 - t^5 + t^4 - t^3 + t^2 - t + 1$ |
| <b>9<sub>2</sub></b>  | $4t^2 - 7t + 4$                                   |
| <b>9<sub>3</sub></b>  | $2t^6 - 3t^5 + 3t^4 - 3t^3 + 3t^2 - 3t + 2$       |
| <b>9<sub>4</sub></b>  | $3t^4 - 5t^3 + 5t^2 - 5t + 3$                     |
| <b>9<sub>5</sub></b>  | $6t^2 - 11t + 6$                                  |
| <b>9<sub>6</sub></b>  | $2t^6 - 4t^5 + 5t^4 - 5t^3 + 5t^2 - 4t + 2$       |
| <b>9<sub>7</sub></b>  | $3t^4 - 7t^3 + 9t^2 - 7t + 3$                     |
| <b>9<sub>8</sub></b>  | $2t^4 - 8t^3 + 11t^2 - 8t + 2$                    |
| <b>9<sub>9</sub></b>  | $2t^6 - 4t^5 + 6t^4 - 7t^3 + 6t^2 - 4t + 2$       |
| <b>9<sub>10</sub></b> | $4t^4 - 8t^3 + 9t^2 - 8t + 4$                     |

|                 |   |
|-----------------|---|
| 9 <sub>11</sub> | $t^6 - 5t^5 + 7t^4 - 7t^3 + 7t^2 - 5t + 1$    |
| 9 <sub>12</sub> | $2t^4 - 9t^3 + 13t^2 - 9t + 2$                |
| 9 <sub>13</sub> | $4t^4 - 9t^3 + 11t^2 - 9t + 4$                |
| 9 <sub>14</sub> | $2t^4 - 9t^3 + 15t^2 - 9t + 2$                |
| 9 <sub>15</sub> | $2t^4 - 10t^3 + 15t^2 - 10t + 2$              |
| 9 <sub>16</sub> | $2t^6 - 5t^5 + 8t^4 - 9t^3 + 8t^2 - 5t + 2$   |
| 9 <sub>17</sub> | $t^6 - 5t^5 + 9t^4 - 9t^3 + 9t^2 - 5t + 1$    |
| 9 <sub>18</sub> | $4t^4 - 10t^3 + 13t^2 - 10t + 4$              |
| 9 <sub>19</sub> | $2t^4 - 10t^3 + 17t^2 - 10t + 2$              |
| 9 <sub>20</sub> | $t^6 - 5t^5 + 9t^4 - 11t^3 + 9t^2 - 5t + 1$   |
| 9 <sub>21</sub> | $2t^4 - 11t^3 + 17t^2 - 11t + 2$              |
| 9 <sub>22</sub> | $t^6 - 5t^5 + 10t^4 - 11t^3 + 10t^2 - 5t + 1$ |
| 9 <sub>23</sub> | $4t^4 - 11t^3 + 15t^2 - 11t + 4$              |
| 9 <sub>24</sub> | $t^6 - 5t^5 + 10t^4 - 13t^3 + 10t^2 - 5t + 1$ |
| 9 <sub>25</sub> | $3t^4 - 12t^3 + 17t^2 - 12t + 3$              |
| 9 <sub>26</sub> | $t^6 - 5t^5 + 11t^4 - 13t^3 + 11t^2 - 5t + 1$ |
| 9 <sub>27</sub> | $t^6 - 5t^5 + 11t^4 - 15t^3 + 11t^2 - 5t + 1$ |
| 9 <sub>28</sub> | $t^6 - 5t^5 + 12t^4 - 15t^3 + 12t^2 - 5t + 1$ |
| 9 <sub>29</sub> | $t^6 - 5t^5 + 12t^4 - 15t^3 + 12t^2 - 5t + 1$ |
| 9 <sub>30</sub> | $t^6 - 5t^5 + 12t^4 - 17t^3 + 12t^2 - 5t + 1$ |
| 9 <sub>31</sub> | $t^6 - 5t^5 + 13t^4 - 17t^3 + 13t^2 - 5t + 1$ |
| 9 <sub>32</sub> | $t^6 - 6t^5 + 14t^4 - 17t^3 + 14t^2 - 6t + 1$ |
| 9 <sub>33</sub> | $t^6 - 6t^5 + 14t^4 - 19t^3 + 14t^2 - 6t + 1$ |
| 9 <sub>34</sub> | $t^6 - 6t^5 + 16t^4 - 23t^3 + 16t^2 - 6t + 1$ |
| 9 <sub>35</sub> | $7t^2 - 13t + 7$                              |
| 9 <sub>36</sub> | $t^6 - 5t^5 + 8t^4 - 9t^3 + 8t^2 - 5t + 1$    |



Alexandermatrix: Jede Kreuzung hat ihre Zeile, jeder Strang seine Spalte.  
Dann eine Zeile und eine Spalte streichen.  
Das Alexanderpolynom ist die Determinante der reduzierten Alexandermatrix.