

Vertex Deletions

The loss of a vertex from a graph has a more drastic result than the loss of an edge. All edges incident on the lost vertex are also eliminated. For each graph listed below (**bold** identification number) there follows a list of its vertex-deleted subgraphs, one subgraph for each vertex. Multiple occurrences of subgraphs are included.

Note that these lists of subgraphs are unique to the graphs. Is this uniqueness a property of all simple graphs? The conjecture that this is so — known as the reconstruction conjecture — was first proposed by Stanislaw Ulam in 1929 and has yet to be proved or disproved.

Weak Reconstruction Conjecture For $v > 2$, no two distinct simple graphs have the same set of vertex-deleted subgraphs.

Strong Reconstruction Conjecture For $v > 2$, any simple graph can be reconstructed from its set of vertex-deleted subgraphs.

The strong conjecture is qualitative. It asks for a method of reconstruction that does not become too complex too fast as the number of vertices grows. The strong conjecture is a special case of the much larger problem of determining how to describe a graph from inside it.

$v = 4 \rightarrow 3$

1: 1 1 1 1
 2: 1 1 2 2
 3: 1 2 2 3
 4: 2 2 2 2
 5: 2 2 2 4
 6: 2 2 3 3
 7: 1 3 3 3
 8: 3 3 3 3
 9: 2 3 3 4
 10: 3 3 4 4
 11: 4 4 4 4

$v = 5 \rightarrow 4$

1: 1 1 1 1 1
 2: 1 1 2 2 2
 3: 1 2 2 3 3
 4: 2 2 2 2 4
 5: 2 2 2 5 5
 6: 1 3 3 3 7
 7: 2 2 3 3 6
 8: 2 3 3 4 4
 9: 2 3 3 5 9
 10: 3 3 3 3 8
 11: 1 7 7 7 7
 12: 2 3 6 6 7
 13: 4 4 4 5 5
 14: 3 3 4 6 6
 15: 3 3 5 5 10
 16: 4 5 6 6 9
 17: 6 6 6 6 6
 18: 3 6 6 7 8
 19: 3 3 6 9 9
 20: 2 7 7 9 9

21: 6 6 8 9 9
 22: 7 7 8 8 8
 23: 5 6 6 9 10
 24: 5 5 5 5 11
 25: 4 9 9 9 9
 26: 3 7 9 9 10
 27: 8 8 9 9 10
 28: 6 9 9 10 10
 29: 5 9 9 9 11
 30: 7 7 10 10 10
 31: 8 10 10 10 10
 32: 9 9 10 10 11
 33: 10 10 10 11 11
 34: 11 11 11 11 11

v = 6 → 5

- 1: 1 1 1 1 1 1
- 2: 1 1 2 2 2 2
- 3: 1 2 2 3 3 3
- 4: 2 2 2 2 4 4
- 5: 2 2 2 5 5 5
- 6: 1 3 3 3 6 6
- 7: 2 2 3 3 7 7
- 8: 2 3 3 4 4 8
- 9: 4 4 4 4 4 4
- 10: 2 3 3 5 9 9
- 11: 3 3 3 3 10 10
- 12: 1 6 6 6 6 11
- 13: 2 3 6 7 7 12
- 14: 3 3 4 7 7 14
- 15: 4 4 4 5 5 13
- 16: 2 6 6 8 8 8
- 17: 4 4 7 7 8 8
- 18: 3 3 8 8 8 8
- 19: 3 3 5 5 15 15
- 20: 2 6 6 9 9 20
- 21: 3 3 7 9 9 19
- 22: 4 5 7 7 9 16
- 23: 3 6 7 7 10 18
- 24: 7 7 7 7 7 17
- 25: 1 1 1 1 1 1 1 1 1 1
- 26: 2 6 1 1 1 2 1 2 1 2
- 27: 3 3 1 2 1 2 1 2 1 2
- 28: 4 8 8 9 9 1 3
- 29: 3 6 8 1 2 1 4 1 4
- 30: 4 7 7 1 2 1 2 1 4
- 31: 5 8 8 8 1 3 1 3
- 32: 8 8 8 8 1 0 1 0
- 33: 7 7 8 8 1 4 1 4
- 34: 5 5 5 5 2 4 2 4
- 35: 3 6 9 9 1 5 2 6
- 36: 5 7 7 9 1 5 2 3
- 37: 4 9 9 9 9 2 5
- 38: 7 7 9 9 1 0 2 1
- 39: 6 6 1 0 1 0 1 0 2 2
- 40: 2 1 1 1 1 2 0 2 0 2 0
- 41: 3 6 1 2 1 9 1 9 2 0
- 42: 7 7 7 1 9 1 9 1 9
- 43: 4 9 1 2 1 2 1 6 2 0
- 44: 3 1 1 1 2 1 2 1 8 1 8
- 45: 8 8 1 3 1 3 1 5 1 5
- 46: 7 8 9 1 4 1 6 1 9
- 47: 5 8 1 2 1 2 1 6 1 6
- 48: 7 7 1 2 1 2 1 8 1 8
- 49: 6 6 1 4 1 4 1 8 1 8
- 50: 8 9 1 3 1 4 1 4 1 6
- 51: 8 1 0 1 2 1 4 1 4 1 8
- 52: 7 1 2 1 2 1 4 1 4 1 7
- 53: 1 3 1 3 1 3 1 3 1 3 1 3
- 54: 1 4 1 4 1 4 1 4 1 4 1 4
- 55: 5 9 9 9 2 4 2 9
- 56: 6 6 1 5 1 5 1 5 3 0
- 57: 7 9 9 1 5 1 5 2 8
- 58: 9 9 1 0 1 0 1 5 2 7
- 59: 3 1 1 2 0 2 0 2 6 2 6
- 60: 6 6 1 9 1 9 2 6 2 6
- 61: 7 9 1 2 1 9 2 3 2 6
- 62: 5 1 2 1 2 2 0 2 3 2 3
- 63: 1 3 1 3 1 3 1 3 2 4 2 4
- 64: 9 9 1 4 1 4 2 3 2 3
- 65: 4 2 0 2 0 2 0 2 0 2 5
- 66: 8 9 1 6 1 9 1 9 2 5
- 67: 8 1 2 1 5 1 6 1 6 2 6
- 68: 7 1 2 1 8 1 9 2 0 2 1
- 69: 6 1 1 1 8 1 8 1 8 2 2
- 70: 1 3 1 4 1 4 1 5 1 6 2 3
- 71: 1 0 1 4 1 4 1 9 1 9 2 1
- 72: 9 1 2 1 4 1 6 1 8 2 1
- 73: 1 0 1 2 1 2 1 8 1 8 2 2
- 74: 8 1 6 1 6 1 8 1 8 2 0
- 75: 1 3 1 3 1 6 1 6 1 6 1 6
- 76: 1 4 1 4 1 8 1 8 1 8 1 8
- 77: 1 4 1 4 1 6 1 6 1 7 1 9
- 78: 1 2 1 2 1 7 1 7 1 8 1 8
- 79: 1 6 1 6 1 7 1 7 2 3 2 3
- 80: 1 7 1 8 1 8 1 9 2 1 2 1
- 81: 1 6 1 6 1 6 1 6 2 1 2 1
- 82: 1 8 1 8 1 8 1 8 2 2 2 2
- 83: 1 5 1 6 1 6 1 8 1 8 2 7
- 84: 1 3 1 6 1 6 2 3 2 3 2 5
- 85: 1 4 1 6 1 8 2 1 2 3 2 6
- 86: 1 4 1 9 1 9 2 1 2 1 2 5
- 87: 1 2 1 8 2 0 2 1 2 1 2 2
- 88: 1 3 1 6 1 6 1 6 2 4 2 9
- 89: 1 4 1 5 1 6 1 9 2 3 2 8
- 90: 9 1 8 1 8 2 0 2 3 2 7
- 91: 1 0 1 8 1 9 1 9 2 6 2 7
- 92: 1 0 1 5 1 5 1 5 1 5 3 1
- 93: 1 2 1 2 2 1 2 1 2 6 2 6
- 94: 1 1 1 1 2 2 2 2 2 2 2 2
- 95: 1 2 1 2 1 5 2 3 2 3 3 0
- 96: 9 1 2 1 9 2 3 2 6 2 8
- 97: 9 9 1 9 1 9 2 9 2 9
- 98: 9 9 1 5 1 5 2 4 3 2
- 99: 8 2 0 2 5 2 5 2 6 2 6
- 100: 7 2 0 2 0 2 6 2 6 2 8
- 101: 5 2 0 2 0 2 0 2 9 2 9
- 102: 6 1 1 2 6 2 6 2 6 3 0
- 103: 2 1 2 1 2 1 2 1 2 1 2 1
- 104: 2 2 2 2 2 2 2 2 2 2 2 2
- 105: 1 7 2 1 2 1 2 3 2 3 2 8
- 106: 1 6 2 1 2 1 2 3 2 5 2 7
- 107: 1 8 2 1 2 1 2 2 2 6 2 7
- 108: 1 6 1 6 2 1 2 1 2 9 2 9
- 109: 1 6 1 6 2 3 2 3 2 8 2 8
- 110: 1 8 1 8 2 3 2 3 2 7 3 0
- 111: 1 8 1 9 2 1 2 6 2 7 2 8
- 112: 2 0 2 0 2 2 2 2 2 7 2 7
- 113: 1 6 1 6 2 3 2 3 2 4 3 2
- 114: 1 5 1 8 2 3 2 3 2 6 3 1
- 115: 1 9 1 9 1 9 2 8 2 8 2 8
- 116: 1 5 1 9 1 9 2 3 2 9 3 2
- 117: 1 5 1 5 1 5 2 4 2 4 3 3
- 118: 1 3 2 5 2 5 2 5 2 9 2 9
- 119: 1 4 2 5 2 6 2 6 2 8 2 8
- 120: 1 0 2 6 2 6 2 6 2 6 3 0
- 121: 1 2 2 0 2 6 2 8 2 8 3 0
- 122: 9 2 0 2 6 2 6 2 9 3 2
- 123: 1 1 1 1 3 0 3 0 3 0 3 0
- 124: 2 1 2 1 2 7 2 7 2 8 2 8
- 125: 2 5 2 5 2 7 2 7 2 7 2 7
- 126: 2 2 2 2 2 7 2 7 2 7 3 0
- 127: 2 1 2 3 2 3 2 8 2 8 3 1
- 128: 2 1 2 1 2 3 2 7 2 9 3 2
- 129: 2 2 2 6 2 6 2 7 2 7 3 1
- 130: 2 3 2 3 2 3 2 3 3 2 3 2
- 131: 2 3 2 3 2 3 2 4 2 9 3 3
- 132: 2 4 2 4 2 4 2 4 2 4 3 4
- 133: 1 7 2 8 2 8 2 8 2 8 2 8
- 134: 1 6 2 5 2 8 2 8 2 9 3 2
- 135: 1 8 2 6 2 8 2 8 3 0 3 1
- 136: 1 9 2 6 2 6 2 8 3 2 3 2
- 137: 1 5 2 6 2 6 2 9 2 9 3 3
- 138: 2 0 2 0 3 0 3 0 3 2 3 2
- 139: 2 7 2 7 2 7 2 7 3 2 3 2
- 140: 2 7 2 7 2 8 2 8 3 1 3 1
- 141: 2 7 2 7 2 7 2 9 2 9 3 3
- 142: 2 2 3 0 3 0 3 1 3 1 3 1
- 143: 2 1 2 8 2 8 3 1 3 2 3 2
- 144: 2 3 2 8 2 8 2 9 3 2 3 3
- 145: 2 4 2 9 2 9 2 9 2 9 3 4
- 146: 2 5 2 5 3 2 3 2 3 2 3 2
- 147: 2 6 2 6 3 0 3 2 3 2 3 3
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- 149: 2 7 3 1 3 1 3 2 3 2 3 3
- 150: 2 8 2 8 3 2 3 2 3 3 3 3
- 151: 2 9 2 9 3 2 3 2 3 2 3 4
- 152: 3 0 3 0 3 0 3 3 3 3 3 3
- 153: 3 1 3 1 3 3 3 3 3 3 3 3
- 154: 3 2 3 2 3 2 3 3 3 3 3 4
- 155: 3 3 3 3 3 3 3 3 3 4 3 4
- 156: 3 4 3 4 3 4 3 4 3 4 3 4

v = 7 → 6

1: 1 1 1 1 1 1 1
2: 1 1 2 2 2 2 2
3: 1 2 2 3 3 3 3
4: 2 2 2 2 4 4 4
5: 2 2 2 5 5 5 5
6: 1 3 3 3 6 6 6
7: 2 2 3 3 7 7 7
8: 2 3 3 4 4 8 8
9: 4 4 4 4 4 4 9
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11: 3 3 3 3 11 11 11
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14: 3 3 4 7 7 14 14
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18: 3 3 8 8 8 8 18
19: 4 8 8 8 8 9 9
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21: 2 6 6 10 10 20 20
22: 3 3 7 10 10 21 21
23: 4 5 7 7 10 22 22
24: 3 6 7 7 11 23 23
25: 7 7 7 7 24 24
26: 1 12 12 12 12 25
27: 2 6 12 13 13 26
28: 3 3 13 13 13 27
29: 4 8 8 10 10 15 28
30: 3 6 8 13 14 14 29
31: 4 7 7 13 13 14 30
32: 7 7 8 8 14 14 33
33: 8 8 8 8 11 11 32
34: 5 8 8 8 15 15 31
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38: 9 9 9 15 15 15 15
39: 8 8 9 14 14 17 17
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41: 5 5 5 5 34 34 34
42: 3 6 10 10 19 35 35
43: 5 7 7 10 19 36 36
44: 4 10 10 10 10 37 37
45: 7 7 10 10 11 38 38
46: 6 6 11 11 11 39 39
47: 2 12 12 20 20 20 40
48: 3 6 13 20 21 21 41
49: 7 7 7 21 21 21 42
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90: 10 10 14 14 36 36 64
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93: 3 10 21 21 22 37 66
94: 8 13 19 22 22 35 67
95: 7 13 20 21 23 38 68
96: 6 12 23 23 23 39 69
97: 14 14 15 19 22 36 70
98: 11 14 14 21 21 38 71
99: 10 13 14 22 23 38 72
100: 11 13 13 23 23 39 73
101: 8 20 22 22 23 23 74
102: 15 15 22 22 22 22 75
103: 14 14 23 23 23 23 76
104: 14 14 21 22 22 24 77
105: 13 13 23 23 24 24 78
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108: 6 6 27 41 41 41 41
109: 7 13 13 41 41 42 42
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111: 3 25 26 26 44 44 44
112: 8 16 28 28 35 35 45
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117: 7 13 26 27 44 48 48
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119: 15 17 17 28 36 36 45
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122: 13 13 14 30 48 48 49
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124: 8 20 28 29 29 43 50
125: 9 22 22 30 30 43 43
126: 8 23 26 30 30 44 51
127: 7 26 26 29 29 52 52
128: 18 18 19 31 31 45 45
129: 17 17 28 28 32 38 38
130: 16 16 32 32 32 39 39
131: 14 18 21 28 33 46 50
132: 17 17 22 22 33 46 46
133: 10 16 29 29 31 50 50
134: 15 17 22 30 30 47 50
135: 14 17 23 29 30 48 51
136: 13 16 23 33 33 49 51
137: 11 18 27 29 29 51 51
138: 14 14 27 30 30 52 52
139: 13 13 29 29 33 52 52
140: 15 28 28 28 31 31 53
141: 17 22 28 31 33 33 50
142: 18 23 29 32 33 33 51
143: 17 24 30 30 33 33 52
144: 14 29 29 30 33 33 54
145: 31 31 31 31 32 32 32
146: 33 33 33 33 33 33 33
147: 10 10 19 19 34 98 98
148: 11 19 19 19 19 92 92
149: 5 20 20 20 55 55 101
150: 10 10 21 21 55 55 97
151: 6 12 35 35 35 56 102
152: 7 20 20 35 35 57 100
153: 10 13 21 35 36 57 96
154: 13 13 19 36 36 56 95
155: 14 19 21 22 36 57 89
156: 15 22 22 22 34 55 88
157: 10 20 23 23 36 58 90
158: 11 21 21 23 35 58 91
159: 19 22 22 23 23 58 83
160: 8 20 35 35 37 37 99

v = 7 → 6

161: 13 13 35 35 38 38 93
162: 12 12 39 39 39 39 94
163: 15 22 22 36 36 37 84
164: 14 22 23 35 36 38 85
165: 14 21 21 37 38 38 86
166: 13 20 23 38 38 39 87
167: 22 22 22 22 38 38 81
168: 23 23 23 23 39 39 82
169: 21 23 23 24 38 38 80
170: 22 22 24 24 36 36 79
171: 3 25 40 40 59 59 59
172: 6 12 41 41 59 60 60
173: 7 20 26 41 59 61 61
174: 5 26 26 40 62 62 62
175: 13 13 21 42 60 61 61
176: 10 13 27 41 61 61 62
177: 15 28 28 28 55 55 63
178: 14 21 21 30 61 61 64
179: 10 20 29 29 62 64 64
180: 4 40 40 40 40 65 65
181: 8 20 41 41 43 65 66
182: 8 26 35 43 43 59 67
183: 7 26 40 41 44 68 68
184: 6 25 44 44 44 69 69
185: 16 16 45 45 45 56 56
186: 10 16 41 41 47 66 66
187: 13 16 35 46 46 60 67
188: 13 13 41 41 48 68 68
189: 12 12 49 49 49 69 69
190: 17 28 28 45 45 57 57
191: 17 22 22 42 42 66 66
192: 18 21 21 46 46 66 66
193: 17 22 30 36 46 61 67
194: 14 28 29 35 46 61 70
195: 15 30 30 36 43 62 70
196: 18 19 27 47 47 67 67
197: 11 29 29 41 41 71 71
198: 10 26 29 44 47 72 72
199: 14 23 30 41 42 68 71
200: 14 21 27 43 48 68 72
201: 13 20 29 46 49 68 72
202: 11 27 27 44 44 73 73
203: 13 23 26 48 48 69 73
204: 28 28 32 32 45 58 58
205: 31 31 31 31 34 63 63
206: 22 28 33 33 36 64 70
207: 19 29 29 31 47 70 70
208: 21 23 29 33 46 71 72
209: 22 22 30 30 48 72 72
210: 23 23 30 30 49 73 73
211: 9 37 43 43 43 43 65
212: 8 40 43 43 44 44 74
213: 15 28 43 43 47 47 75
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215: 18 29 35 45 50 50 67
216: 18 23 41 46 46 51 74
217: 16 20 49 49 50 50 74
218: 17 22 43 47 48 48 74
219: 17 30 38 43 46 51 68
220: 14 30 44 44 48 48 76
221: 16 26 39 51 51 51 69
222: 14 29 41 43 46 52 77
223: 13 26 44 49 52 52 78
224: 22 28 31 46 46 50 75
225: 31 33 33 36 45 50 70
226: 32 33 33 38 46 46 71
227: 28 30 33 38 50 51 72
228: 23 29 33 48 49 51 76
229: 29 29 32 39 51 51 73
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231: 23 30 33 46 47 52 77
232: 21 29 29 50 50 52 77
233: 24 30 30 48 48 52 78
234: 23 27 29 51 52 52 78
235: 18 44 44 51 51 51 51
236: 17 43 43 50 50 52 52
237: 31 31 45 45 45 53 53
238: 28 28 50 50 50 50 53
239: 31 32 47 50 50 51 51
240: 33 33 48 51 51 52 52
241: 33 33 46 46 50 50 54
242: 29 29 49 51 51 54 54
243: 30 30 52 52 52 52 54
244: 19 19 19 34 34 117 117
245: 10 20 35 35 55 98 122
246: 19 21 21 36 55 98 116
247: 11 35 35 35 35 92 120
248: 19 23 35 36 36 92 114
249: 22 22 34 36 36 98 113
250: 12 12 56 56 56 56 123
251: 13 20 35 56 57 57 121
252: 21 21 21 57 57 57 115
253: 14 35 35 37 57 57 119
254: 15 37 37 37 55 55 118
255: 22 22 36 36 57 57 109
256: 23 23 36 36 56 58 110
257: 21 23 35 38 57 58 111
258: 20 20 39 39 58 58 112
259: 22 22 38 38 55 55 108
260: 22 36 37 38 38 58 106
261: 23 35 38 38 39 58 107
262: 24 36 36 38 38 57 105
263: 39 39 39 39 39 39 104
264: 38 38 38 38 38 38 103
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266: 10 20 41 41 97 97 101
267: 21 21 21 42 97 97 97
268: 6 25 59 59 59 102 102
269: 12 12 60 60 60 102 102
270: 7 40 40 59 59 100 100
271: 10 26 41 59 62 96 96
272: 13 20 41 60 61 96 100
273: 13 26 35 61 61 95 102
274: 21 21 27 61 61 96 96
275: 19 27 27 62 62 95 95
276: 14 35 41 43 61 89 100
277: 15 43 43 43 55 88 101
278: 11 41 41 44 59 91 91
279: 10 40 44 44 62 90 90
280: 28 28 45 45 63 98 98
281: 19 29 41 47 62 89 89
282: 22 30 36 42 61 89 96
283: 21 29 35 46 64 89 96
284: 30 30 36 36 64 95 95
285: 22 28 46 46 55 88 97
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287: 20 20 49 49 64 90 90
288: 23 23 42 42 60 91 91
289: 32 45 45 45 45 92 92
290: 33 36 36 46 46 89 89
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293: 22 36 43 48 48 83 90
294: 23 35 46 46 49 83 91
295: 8 40 59 59 65 65 99
296: 16 20 60 60 66 66 99
297: 16 26 56 67 67 67 102
298: 13 26 59 60 68 68 93
299: 12 25 69 69 69 69 94
300: 18 35 41 66 66 67 99
301: 17 37 43 61 61 66 99
302: 15 43 43 62 62 65 84
303: 17 43 43 57 67 67 100
304: 14 43 44 59 61 68 85
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319: 28 37 50 50 64 64 84
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322: 33 38 46 51 61 64 85
323: 29 35 49 50 70 72 85
324: 33 36 47 48 67 72 85
325: 22 43 46 47 68 72 81
326: 33 38 42 46 66 71 86
327: 30 37 46 46 72 72 86

v = 7 → 6

328: 32 46 46 51 58 67 91
329: 28 43 51 51 58 70 90
330: 29 39 41 51 71 71 87
331: 30 38 43 48 72 73 87
332: 23 44 48 48 69 73 82
333: 24 42 48 48 68 68 80
334: 23 41 49 52 68 71 80
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336: 22 43 52 52 62 64 79
337: 24 46 46 52 61 61 79
338: 38 46 46 50 50 71 81
339: 45 50 50 51 51 58 83
340: 39 49 49 51 51 73 82
341: 38 46 48 51 52 72 80
342: 36 47 50 52 52 70 79
343: 9 65 65 65 65 65 65
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345: 17 43 65 66 68 68 74
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391: 20 20 60 60 97 122 122
392: 19 41 41 62 101 116 116
393: 21 35 41 61 97 116 122
394: 36 36 42 42 97 116 116
395: 11 59 59 59 59 120 120
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401: 36 46 46 55 64 113 116
402: 36 36 48 61 61 114 114
403: 35 35 49 64 64 114 114
404: 12 25 102 102 102 102 123
405: 13 40 59 100 100 102 121
406: 20 26 60 96 96 102 121
407: 26 26 56 95 95 95 123
408: 21 41 41 96 96 100 115
409: 27 35 41 95 96 96 121
410: 14 59 59 65 100 100 119
411: 15 65 65 65 101 101 118
412: 22 43 61 62 96 100 109
413: 29 35 60 66 89 96 119
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415: 29 41 56 67 89 89 121
416: 30 43 57 61 89 95 121
417: 28 37 66 66 97 97 118
418: 28 43 67 67 88 98 122
419: 22 43 68 68 97 101 108
420: 21 44 59 68 90 96 111
421: 23 41 60 68 91 100 111
422: 23 44 61 61 91 102 110
423: 20 40 69 69 90 90 112
424: 36 46 47 61 89 96 109
425: 42 46 46 57 89 89 115
426: 45 46 46 70 88 98 116
427: 38 46 46 71 97 97 108
428: 35 41 49 72 89 90 111
429: 38 42 48 61 91 96 111
430: 36 48 48 62 90 95 110
431: 39 41 41 73 91 91 112
432: 33 57 61 66 67 89 119
433: 31 55 66 66 66 88 118
434: 22 62 65 68 68 90 106
435: 32 67 67 67 67 92 120
436: 23 59 68 68 69 91 107
437: 24 61 61 68 68 100 105
438: 46 50 57 64 70 89 109

439: 50 50 63 70 70 98 113
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457: 38 68 68 71 72 72 103
458: 39 69 69 73 73 73 104
459: 52 57 70 70 72 72 105
460: 16 40 99 99 99 102 102
461: 25 25 94 94 94 94 94
462: 26 26 93 93 93 102 102
463: 17 65 65 99 99 100 100
464: 18 59 59 99 99 99 99
465: 28 43 66 84 96 96 99
466: 29 44 67 85 85 95 102
467: 30 43 68 85 93 96 100
468: 29 41 60 86 86 93 99
469: 27 44 59 87 87 93 93
470: 26 40 69 87 87 87 94
471: 45 47 47 84 84 95 95
472: 46 46 48 85 85 96 96
473: 41 41 49 86 86 87 87
474: 31 62 67 67 84 84 99
475: 31 74 74 74 88 88 101
476: 33 67 68 74 85 89 100
477: 33 61 66 68 85 86 99
478: 32 66 66 74 91 91 99
479: 28 65 74 74 84 90 90
480: 29 59 69 74 85 85 87
481: 30 65 68 68 86 87 87
482: 45 50 66 75 84 89 89
483: 50 51 70 71 85 89 96
484: 46 50 61 72 84 85 86
485: 46 46 66 66 81 86 86
486: 47 47 67 67 81 81 93
487: 46 51 68 76 85 90 91
488: 51 51 71 71 91 91 93
489: 47 51 62 73 85 85 87
490: 43 43 72 72 81 87 87
491: 44 44 73 73 82 82 94
492: 48 48 68 68 82 87 87
493: 50 50 77 77 88 88 97
494: 49 49 60 77 80 85 85

$v = 7 \rightarrow 6$

495: 48 52 61 72 80 85 93	509: 51 66 71 72 77 80 86
496: 42 52 68 68 80 86 86	510: 52 68 71 73 76 80 87
497: 41 44 69 78 80 80 87	511: 50 64 66 77 77 79 84
498: 46 52 67 77 79 89 96	512: 52 61 72 77 78 79 85
499: 52 52 70 70 79 95 95	513: 47 62 74 78 78 79 79
500: 43 43 78 78 79 90 90	514: 51 67 77 77 78 83 91
501: 53 70 70 70 70 84 84	515: 48 68 68 78 78 80 80
502: 53 63 75 75 75 88 88	516: 54 64 72 72 76 85 85
503: 50 67 70 72 75 81 85	517: 54 71 71 71 71 86 86
504: 50 70 74 76 76 83 90	518: 54 70 70 77 77 89 89
505: 45 74 74 75 75 83 83	519: 72 72 76 76 77 78 80
506: 51 72 72 73 74 82 87	520: 73 73 78 78 78 78 82
507: 49 69 69 76 76 82 82	521: 71 71 77 77 77 77 81
508: 46 68 72 74 77 80 81	522: 70 70 75 75 77 77 79

This completes the *sparse* graphs on 7 vertices. To find the vertex-deleted subgraphs of a *dense* graph, first find the identification number of its complement. Then find that number's subgraphs in the list above, and change all ID numbers in that list to their complementary ID numbers. Any **bold** 7-point ID number in this list can easily be transformed to its complement by subtracting it from 1045. Then subtract plain-type 6-point ID numbers from 157.

Example: To find graph #**834**, either use Chapter 2 to look up its complement, or subtract: $1045 - 834 = \mathbf{211}$. Now find the subgraphs for 211 —

211: 9 37 43 43 43 43 65

— and subtract all 6-point ID#s from 157:

834: 92 114 114 114 114 120 148.