

## 12 Rings Truth Tables

A 1,2,3,4	B 5,6,7,8	
0	0	A = B; the special ring is in 9,10,11,12
0	1	A < B; 5,6,7,8 (contains a heavy ring) or (1,2,3,4 contains a light ring)
1	0	A > B; (1,2,3,4 contains a heavy ring) or (5,6,7,8) contains a light right)

If (A = B)

Outcome 1

A 6,7,8	B 9,10,11													
0	0	<b>Outcome 1a</b>  A = B; 12 is the special ring so weight it against any other right to determine If it is heavy or light <table> <tr> <th>A 12</th><th>A 1</th><th></th></tr> <tr> <td>0</td><td>0</td><td>A = B; this cannot happen</td></tr> <tr> <td>0</td><td>1</td><td>A &lt; B; 12 is the special heavy ring</td></tr> <tr> <td>1</td><td>0</td><td>A &gt; B; 12 is the special light ring</td></tr> </table>	A 12	A 1		0	0	A = B; this cannot happen	0	1	A < B; 12 is the special heavy ring	1	0	A > B; 12 is the special light ring
A 12	A 1													
0	0	A = B; this cannot happen												
0	1	A < B; 12 is the special heavy ring												
1	0	A > B; 12 is the special light ring												
0	1	<b>Outcome 1b</b>  A < B; 9, 10, 11 contains a heavy ring <table> <tr> <th>A 9</th><th>A 10</th><th></th></tr> <tr> <td>0</td><td>0</td><td>A = B; 11 is the special heavy ring</td></tr> <tr> <td>0</td><td>1</td><td>A &lt; B; 10 is the special heavy ring</td></tr> <tr> <td>1</td><td>0</td><td>A &gt; B; 9 is the special heavy ring</td></tr> </table>	A 9	A 10		0	0	A = B; 11 is the special heavy ring	0	1	A < B; 10 is the special heavy ring	1	0	A > B; 9 is the special heavy ring
A 9	A 10													
0	0	A = B; 11 is the special heavy ring												
0	1	A < B; 10 is the special heavy ring												
1	0	A > B; 9 is the special heavy ring												
1	0	<b>Outcome 1c</b>  A > B; 9, 10,11 contains a light ring <table> <tr> <th>A 9</th><th>B 10</th><th></th></tr> <tr> <td>0</td><td>0</td><td>A = B; 11 is the special light ring</td></tr> <tr> <td>0</td><td>1</td><td>A &lt; B; 9 is the special light ring</td></tr> <tr> <td>1</td><td>0</td><td>A &gt; B; 10 is the special light ring</td></tr> </table>	A 9	B 10		0	0	A = B; 11 is the special light ring	0	1	A < B; 9 is the special light ring	1	0	A > B; 10 is the special light ring
A 9	B 10													
0	0	A = B; 11 is the special light ring												
0	1	A < B; 9 is the special light ring												
1	0	A > B; 10 is the special light ring												

Else If ( $A < B$ )

Outcome 2

A 1,2,5	B 3,6,12													
0	0	<b>Outcome 2a</b>  A = B; (4 is the special light ring) or (7 or 8 is the special heavy ring) <table> <tr> <th>A 7</th><th>B 8</th><th></th></tr> <tr> <td>0</td><td>0</td><td>A = B; 4 is the special light ring</td></tr> <tr> <td>0</td><td>1</td><td>A &lt; B; 8 is the heavy special ring</td></tr> <tr> <td>1</td><td>0</td><td>B &gt; A; 7 is the heavy special ring</td></tr> </table>	A 7	B 8		0	0	A = B; 4 is the special light ring	0	1	A < B; 8 is the heavy special ring	1	0	B > A; 7 is the heavy special ring
A 7	B 8													
0	0	A = B; 4 is the special light ring												
0	1	A < B; 8 is the heavy special ring												
1	0	B > A; 7 is the heavy special ring												
0	1	<b>Outcome 2b</b>  A < B; (6 is the special heavy ring) or (1 or 2) is the special right ring <table> <tr> <th>A 1</th><th>B 2</th><th></th></tr> <tr> <td>0</td><td>0</td><td>A = B; 6 is the special heavy ring</td></tr> <tr> <td>0</td><td>1</td><td>A &lt; B; 1 is the special light ring</td></tr> <tr> <td>1</td><td>0</td><td>A &lt; B; 2 is the special light ring</td></tr> </table>	A 1	B 2		0	0	A = B; 6 is the special heavy ring	0	1	A < B; 1 is the special light ring	1	0	A < B; 2 is the special light ring
A 1	B 2													
0	0	A = B; 6 is the special heavy ring												
0	1	A < B; 1 is the special light ring												
1	0	A < B; 2 is the special light ring												
1	0	<b>Outcome 2c</b>  A > B (3 is light) or (4 is heavy) <table> <tr> <th>A 3</th><th>B 1</th><th></th></tr> <tr> <td>0</td><td>0</td><td>A = B; 5 is the special heavy ring</td></tr> <tr> <td>0</td><td>1</td><td>A &lt; B; 3 is the special light ring</td></tr> <tr> <td>1</td><td>0</td><td>A &gt; B; 3 is the special light ring (yes, same as A &lt; B)</td></tr> </table>	A 3	B 1		0	0	A = B; 5 is the special heavy ring	0	1	A < B; 3 is the special light ring	1	0	A > B; 3 is the special light ring (yes, same as A < B)
A 3	B 1													
0	0	A = B; 5 is the special heavy ring												
0	1	A < B; 3 is the special light ring												
1	0	A > B; 3 is the special light ring (yes, same as A < B)												

If (A > B)

**Outcome 3**

A 5,6,1	B 7,2,12													
0	0	<b>Outcome 3a</b>  A = B; (8 is the special light ring) or (3 or 4 is the special heavy ring) <table> <tr> <th>A 3</th><th>B 4</th><th></th></tr> <tr> <td>0</td><td>0</td><td>A = B; 8 is the special light ring</td></tr> <tr> <td>0</td><td>1</td><td>A &lt; B; 4 is the special heavy ring</td></tr> <tr> <td>1</td><td>0</td><td>A &gt; B; 3 is the special heavy ring</td></tr> </table>	A 3	B 4		0	0	A = B; 8 is the special light ring	0	1	A < B; 4 is the special heavy ring	1	0	A > B; 3 is the special heavy ring
A 3	B 4													
0	0	A = B; 8 is the special light ring												
0	1	A < B; 4 is the special heavy ring												
1	0	A > B; 3 is the special heavy ring												
0	1	<b>Outcome 3b</b>  A < B; (2 is the special heavy ring) or (5 or 6 is the special light ring) <table> <tr> <th>A 5</th><th>A 6</th><th></th></tr> <tr> <td>0</td><td>0</td><td>A = B; 2 is the special heavy ring</td></tr> <tr> <td>0</td><td>1</td><td>A &lt; B; 5 is special light ring</td></tr> <tr> <td>1</td><td>0</td><td>A &gt; B; 6 is the special light ring</td></tr> </table>	A 5	A 6		0	0	A = B; 2 is the special heavy ring	0	1	A < B; 5 is special light ring	1	0	A > B; 6 is the special light ring
A 5	A 6													
0	0	A = B; 2 is the special heavy ring												
0	1	A < B; 5 is special light ring												
1	0	A > B; 6 is the special light ring												
1	0	<b>Outcome 3c</b>  A > B (7 is light) or (1 is heavy) <table> <tr> <th>A 7</th><th>B 11</th><th></th></tr> <tr> <td>0</td><td>0</td><td>A = B; 1 is the special heavy ring</td></tr> <tr> <td>0</td><td>1</td><td>A &lt; B; 7 this cannot happen</td></tr> <tr> <td>1</td><td>0</td><td>A &gt; B; 7 is the special light ring</td></tr> </table>	A 7	B 11		0	0	A = B; 1 is the special heavy ring	0	1	A < B; 7 this cannot happen	1	0	A > B; 7 is the special light ring
A 7	B 11													
0	0	A = B; 1 is the special heavy ring												
0	1	A < B; 7 this cannot happen												
1	0	A > B; 7 is the special light ring												

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