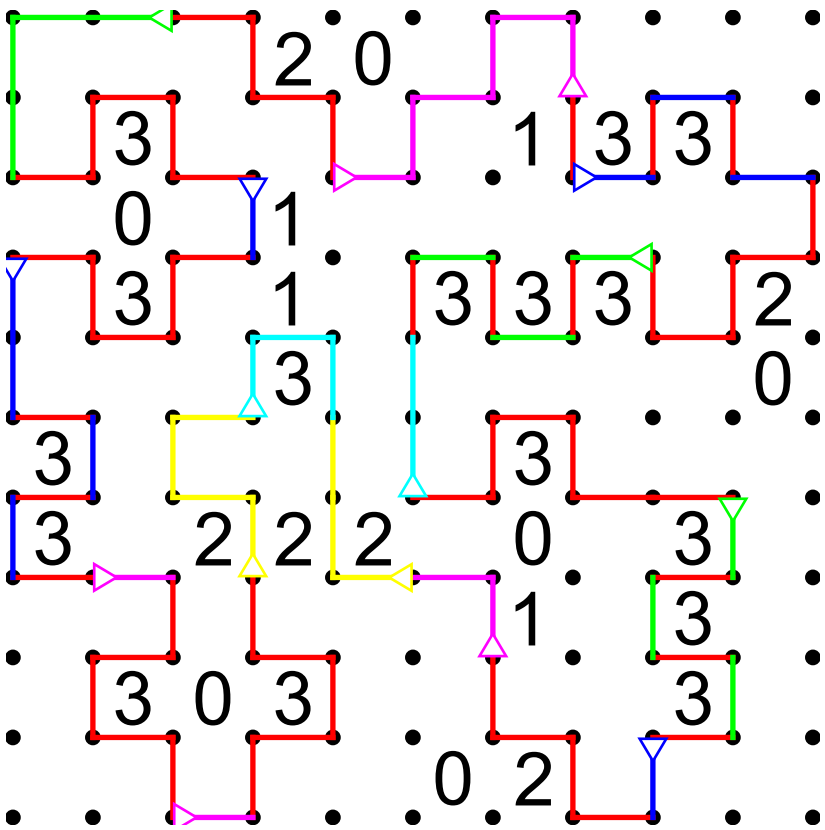
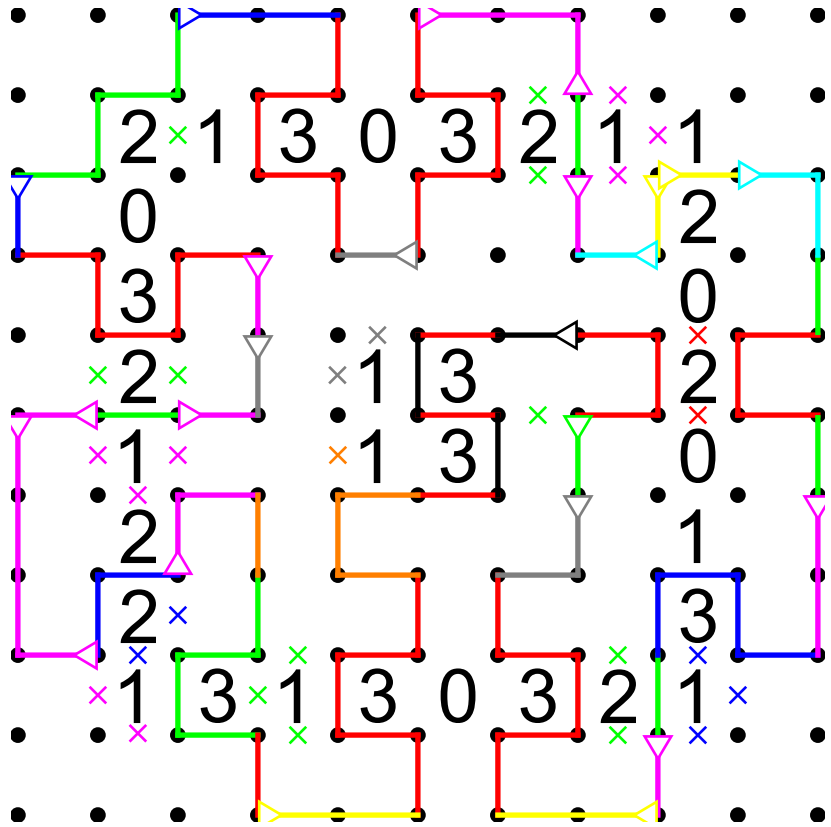
San Diego Math Circle - Fermat
September 24, 2011

Connect the Dots:
Logic Puzzles of the Slitherlink & Masyu variety
SOLUTIONS

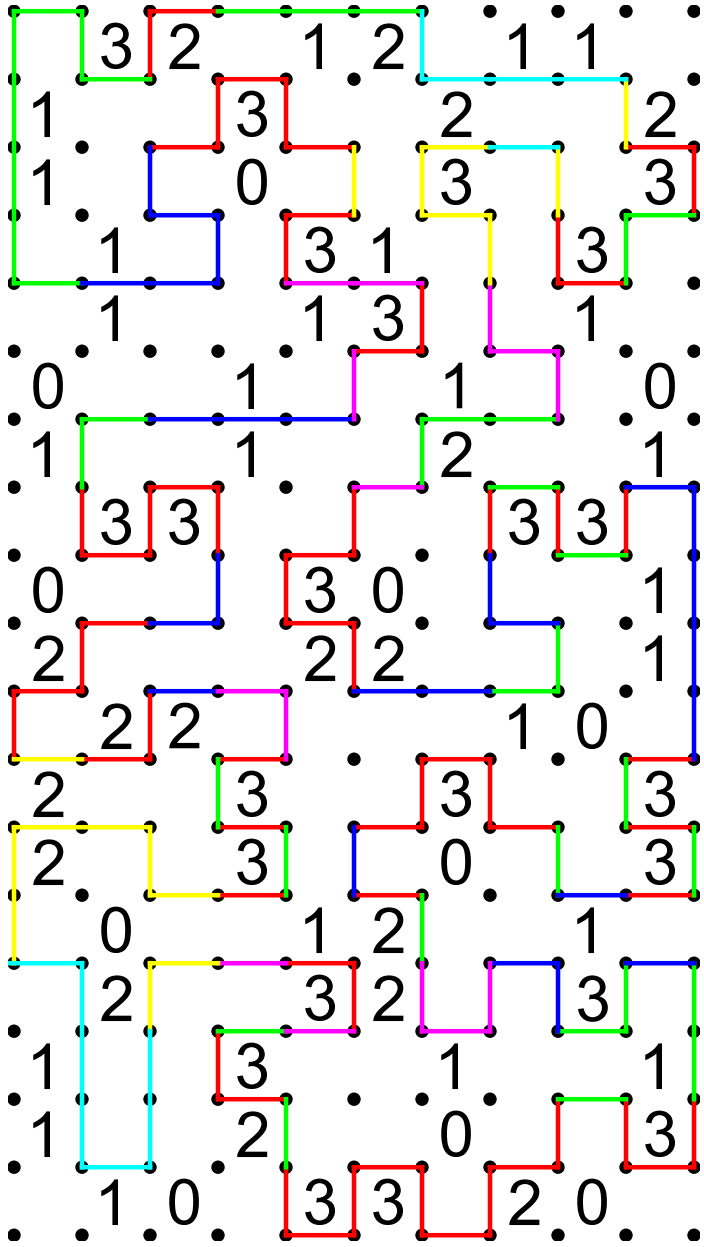
NOTE: Triangles indicate starting point of deduced paths.



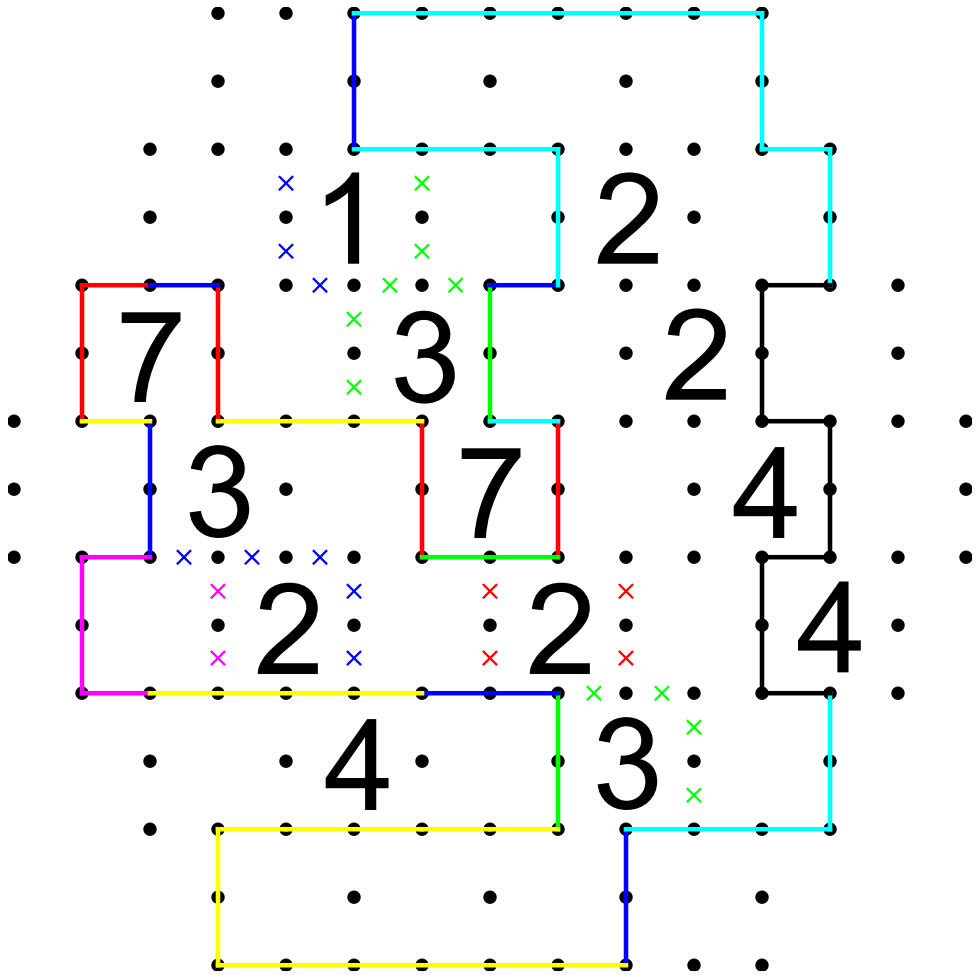
1. (red) Directly filled in via known patterns (Adjacent 3's, 3 adjacent to 0, 2 adjacent to 0 at edge of puzzle).
2. (green) Follows directly from red. (In the upper left corner, it is the only available path. For the adjacent 3's, intersection with other patterns forced one of the two possible choices.)
3. (blue) Follows directly from green.
4. (magenta) Follows directly from blue.
5. (yellow) Follows directly from magenta.
6. (cyan) Follows directly from yellow.



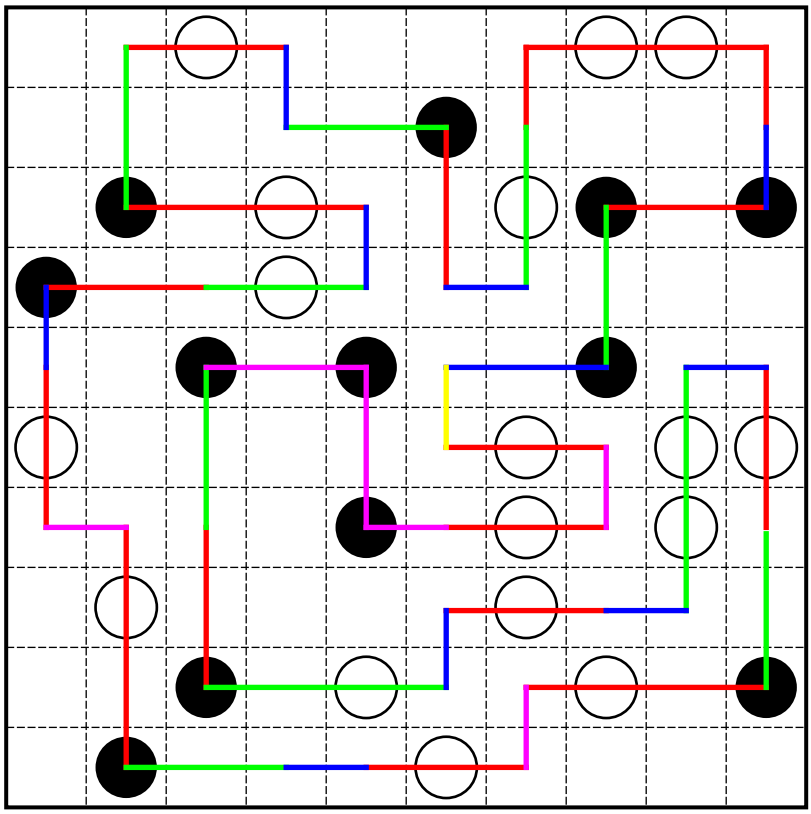
1. (red) Directly filled in via known patterns (Adjacent 3's, 3 adjacent to 0, 2 adjacent to multiple 0's).
2. (green) Follows directly from red. (Only viable paths or constrained by unused segments.)
3. (blue) Follows directly from green.
4. (magenta) Follows directly from blue.
5. (yellow) Follows directly from magenta. In upper left, 2's upper corner must have 0 or 2 segments (0 leaves only 1 possible segment for the 2).
6. (cyan) Follows directly from yellow.
7. (black) Follows directly from cyan.
8. (grey) Follows directly from black.
9. (orange) Follows directly from grey.



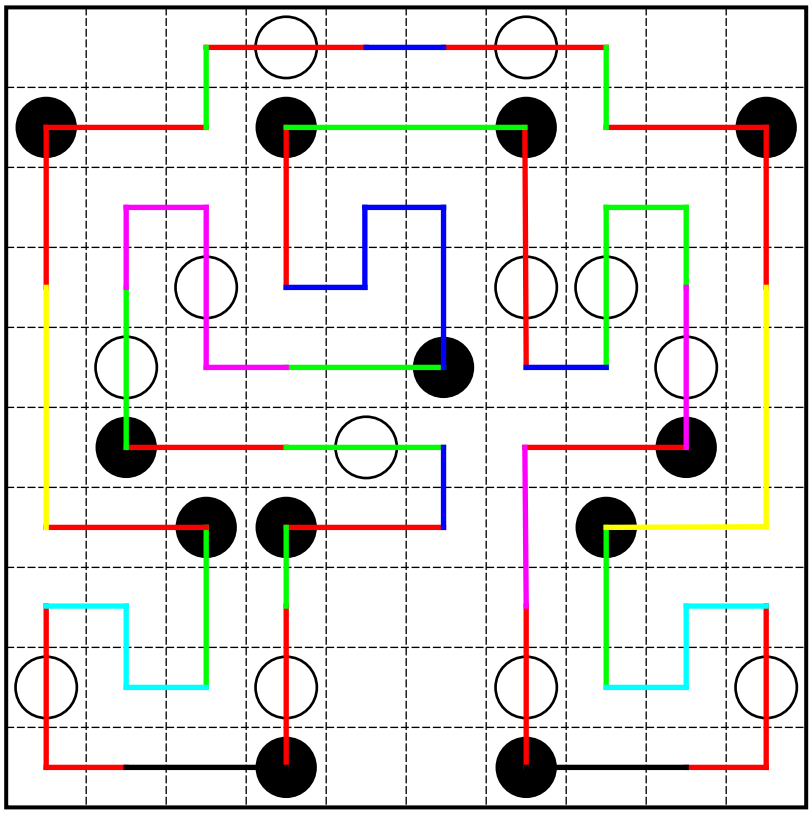
1. (red) Directly filled in via known patterns (Adjacent 3's, 3 adjacent to 0, 2 adjacent to multiple 0's) and next steps.
2. (green) Follows directly from red. (Only viable paths or constrained by unused segments.)
3. (blue) Follows directly from green.
4. (magenta) Follows directly from blue.
5. (yellow) Follows directly from magenta.



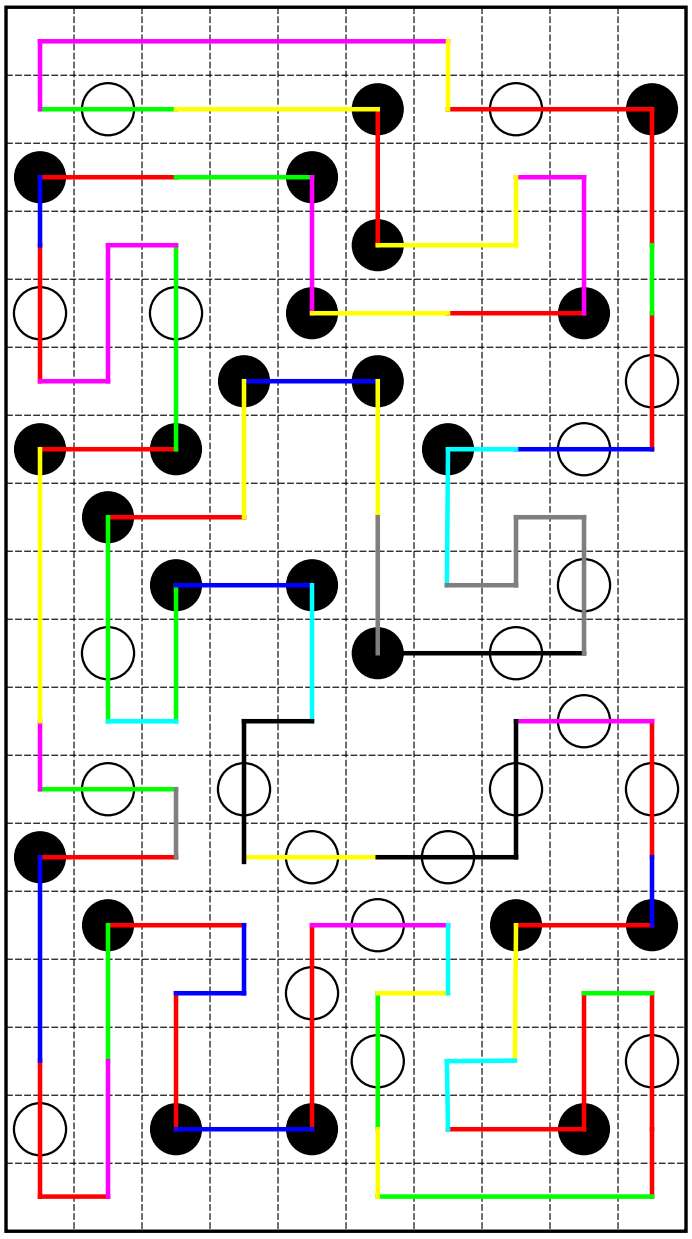
1. (red) Vertical segments around the 7's must be filled in (if 1 is blank, the other is blank, which does not leave enough segments for the 7's).
2. (green) Follows directly from red. (The loop must exit up out of the 7, or it would fill too many segments around the adjacent 2. This forces some of the neighboring segments.)
3. (blue) Follows directly from green. In particular, the non-segments around the 1 are forced by the 3, and in turn force the 7 to the left. This forces the 3.
4. (magenta) Follows directly from blue.
5. (yellow) Follows directly from magenta. (The only possible paths left around the bottom-left of the board that don't close the loop.)
6. (cyan) Follows directly from yellow.
7. (black) Follows directly from cyan.



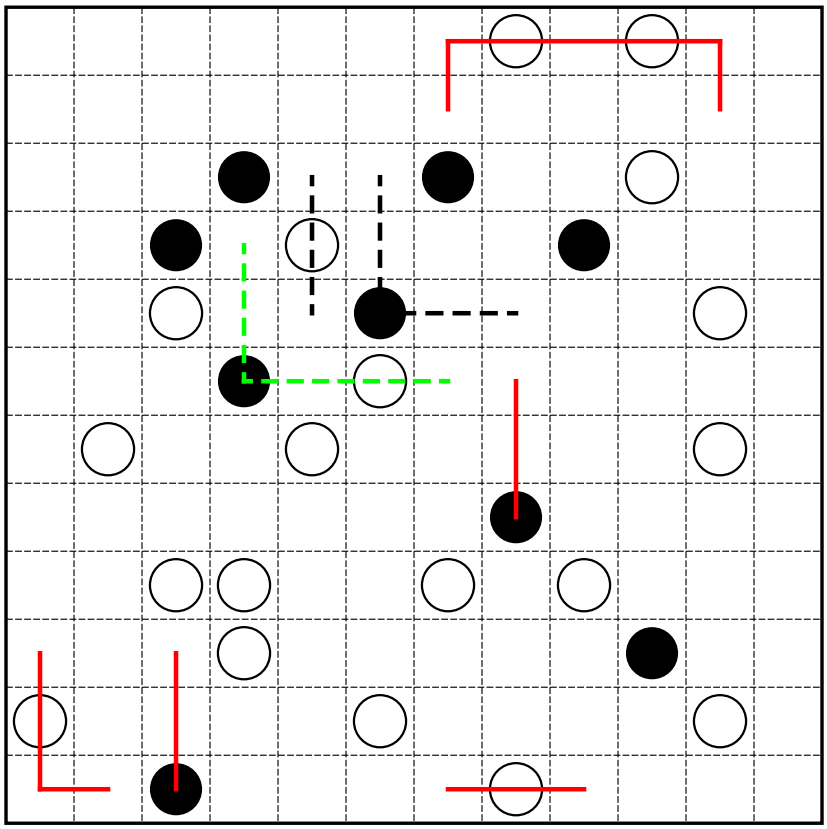
1. (red) Directly filled in via known patterns (Circles near the edge of the board and triple white circles.).
2. (green) Follows directly from red. (Constrained by pre-existing paths.)
3. (blue) Follows directly from green.
4. (magenta) Follows directly from blue.
5. (yellow) Last remaining segment.



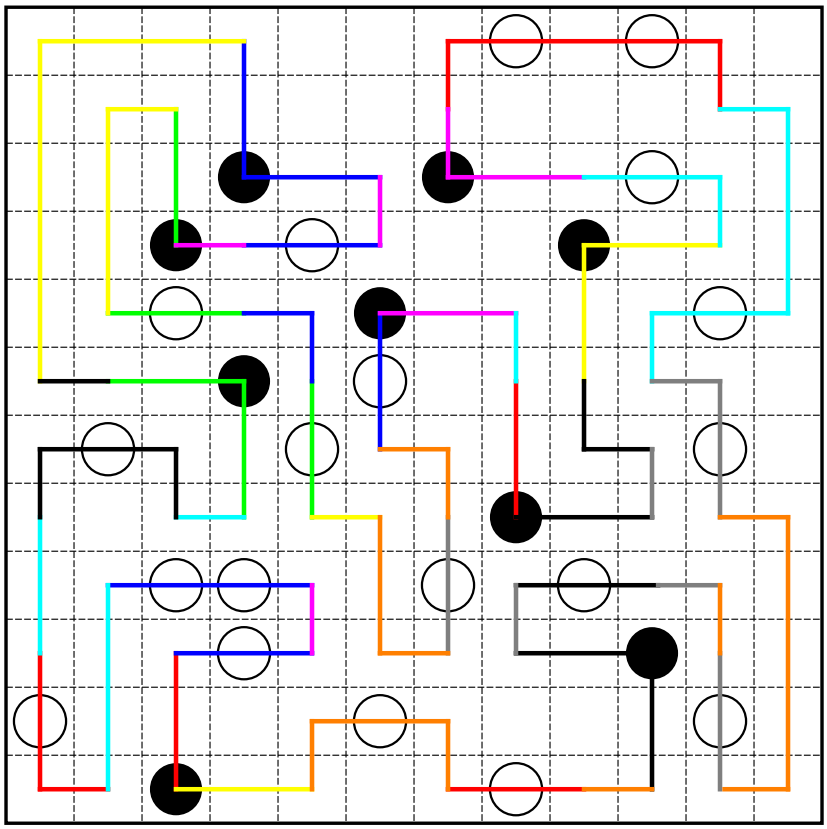
1. (red) Directly filled in via known patterns (Circles near the edge of the board and adjacent black circles.).
2. (green) Follows directly from red. (Constrained by pre-existing paths.)
3. (blue) Follows directly from green.
4. (magenta) Follows directly from blue.
5. (yellow) Follows directly from magenta.
6. (cyan) Follows directly from yellow.
7. (black) Last remaining segments.



1. (red) Directly filled in via known patterns (Circles near the edge of the board.).
2. (green) Follows directly from red. (Constrained by pre-existing paths.)
3. (blue) Follows directly from green.
4. (magenta) Follows directly from blue.
5. (yellow) Follows directly from magenta.
6. (cyan) Follows directly from yellow.
7. (black) Follows directly from cyan.



1. (red) Directly filled in via known patterns (Circles near the edge of the board and forced direction for the bottom-right black circle.).
2. (green) Black circle has two possibilities. This one leads to a contradiction.



1. (red) Directly filled in via known patterns (Circles near the edge of the board and forced direction for the bottom-right black circle.).
2. (green) Black circle has two possibilities. This one must be the case.
3. (blue) Follows directly from green.
4. (magenta) Follows directly from blue.
5. (yellow) Follows directly from magenta.
6. (cyan) Follows directly from yellow.
7. (black) Follows directly from cyan.
8. (grey) Last remaining segments.