Why might the number of line segments visible in the image differ from the calculated number of segments?

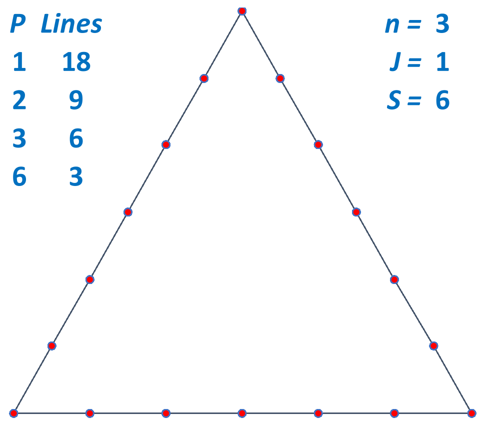
There are a variety of reasons why this may occur.

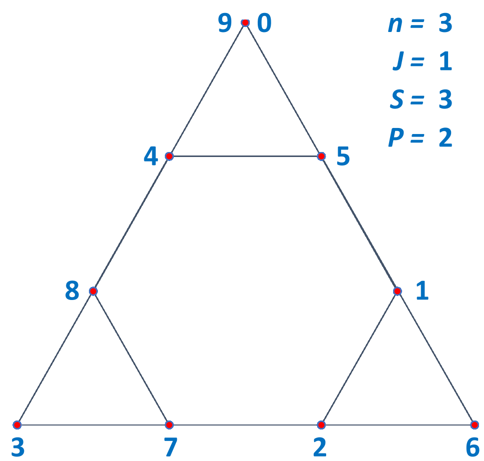
1) If S is a multiple of P, $S = m*P$, then each line in the vertex frame is created by connecting **m** segments.

Take the example to the right with values of n, J, and S listed. Four of the six values of $P \le 6$ produce the vertex frame which clearly only has three line segments in the final image. But the calculated number of line segments vary dramatically.

Each line in the vertex frame contains m segments in this instance so if $P = 1$, $m = 6$, and so on for other values of P.

P	*Lines*
1	18
2	9
3	6
6	3





2) The triangular image at the left, used to explain S versus P counts 9 line segments to create the image.

Visual inspection of this image confirms that there are only 6 segments: the three lines in the vertex frame and the three lines from 1 to 2, 4 to 5, and 7 to 8.

The difficulty here is that, in order to complete the image while maintaining the counting pattern, one needs 9 line segments to create the 6 line final image. Some of those segments partially overlap in achieving this image. For example, the last half of the 1st segment coincides with the first half of the 6th segment.

Additional reasons occur in files 3-5. Both vertex frame images appear the same: a square with diagonals and 6 visible lines. The left image requires 8 segments to create the diagonals, one half at a time (the right half of the horizontal line is 1 - 2 - 3). The right image maps each diagonal twice (1 - 2 and 5 - 6).