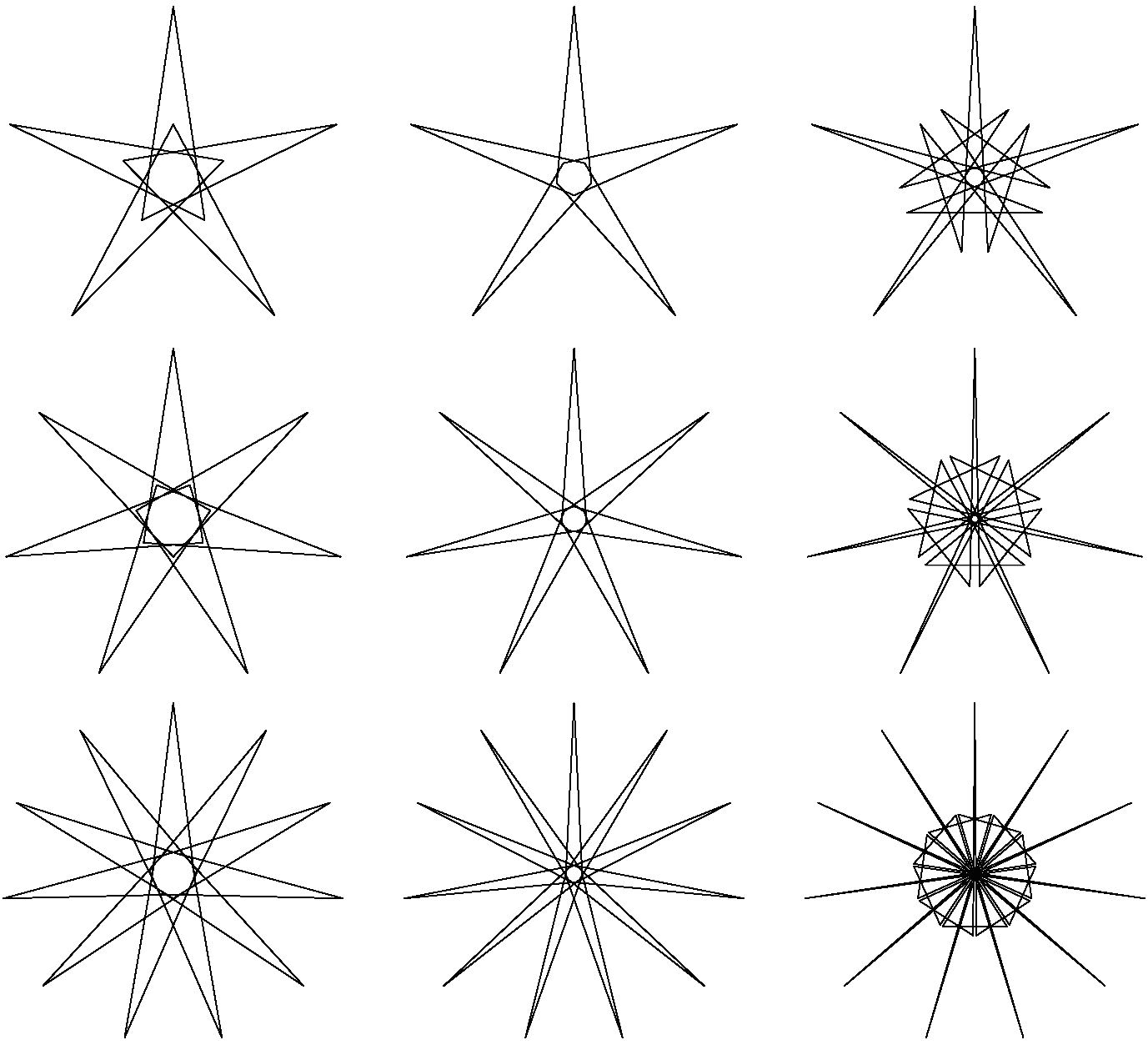
Odd Needle Stars

Needle stars are stars that are created with very sharp points. These points are sharper than you can get by setting ***S*** = ***P***. Three rows are shown here (5, 7 and 11 **point** stars) with three versions in each row. Each column has the same ***S***, ***P***, ***J***, and ***n*** attributes as noted at the top of each column.

S = 2, ***P*** = 3, ***J*** = (***n***-1)/2, ***n*** = **point**	***S*** = 2, ***P*** = 3, ***J*** = (***n***-1)/2, ***n*** = 3***point**	***S*** = 3, ***P*** = 4, ***J*** = (***n***-1)/2, ***n*** = **point**
Lines per image: 2***point**	2***point**	3***point**



The needles get sharper in going from left to right in a row, and as the number of points increases, so does the sharpness of individual points in a given column. It appears that the bottom left 11-star is no sharper than the version drawn with 11 rather than 22 lines. But a quick check confirms that the angles are sharper here than you scroll ***S*** up one so that ***S*** = ***P*** = 3. Notice that the structure of each star first two columns is within each "leg" of the star, but in the third column there is a framework that extends beyond these legs.

A couple of questions to ponder: Can you find examples of even pointed needle stars? If so, can you determine rules such as those above that produce even point stars?