

Octagonal Challenge Questions

CLAIM: The **Red** and **Blue** images below were created without n being a multiple of 8. The **Black** image is a regular octagon which has 8 lines of symmetry and all 8 angles are equal to 135° . If you look at the top three vertex angles, $\angle 8, \angle 7, \angle 6$, you will note that $\angle 6 < \angle 7 < \angle 8 < 135^\circ$. Consider **Red** versus **Blue**.

1. Which color has vertical and horizontal symmetry, and which has only vertical symmetry?
2. Given **Red** $n = 9$, what values of S , P , and J produced the **Red** image? (Many answers are possible, but only one simplified set of values occurs).
3. Given **Blue** $S = 2$, what values of P , J , and n produced the **Blue** image? (Many answers are possible, but only one simplified set of values occurs).

