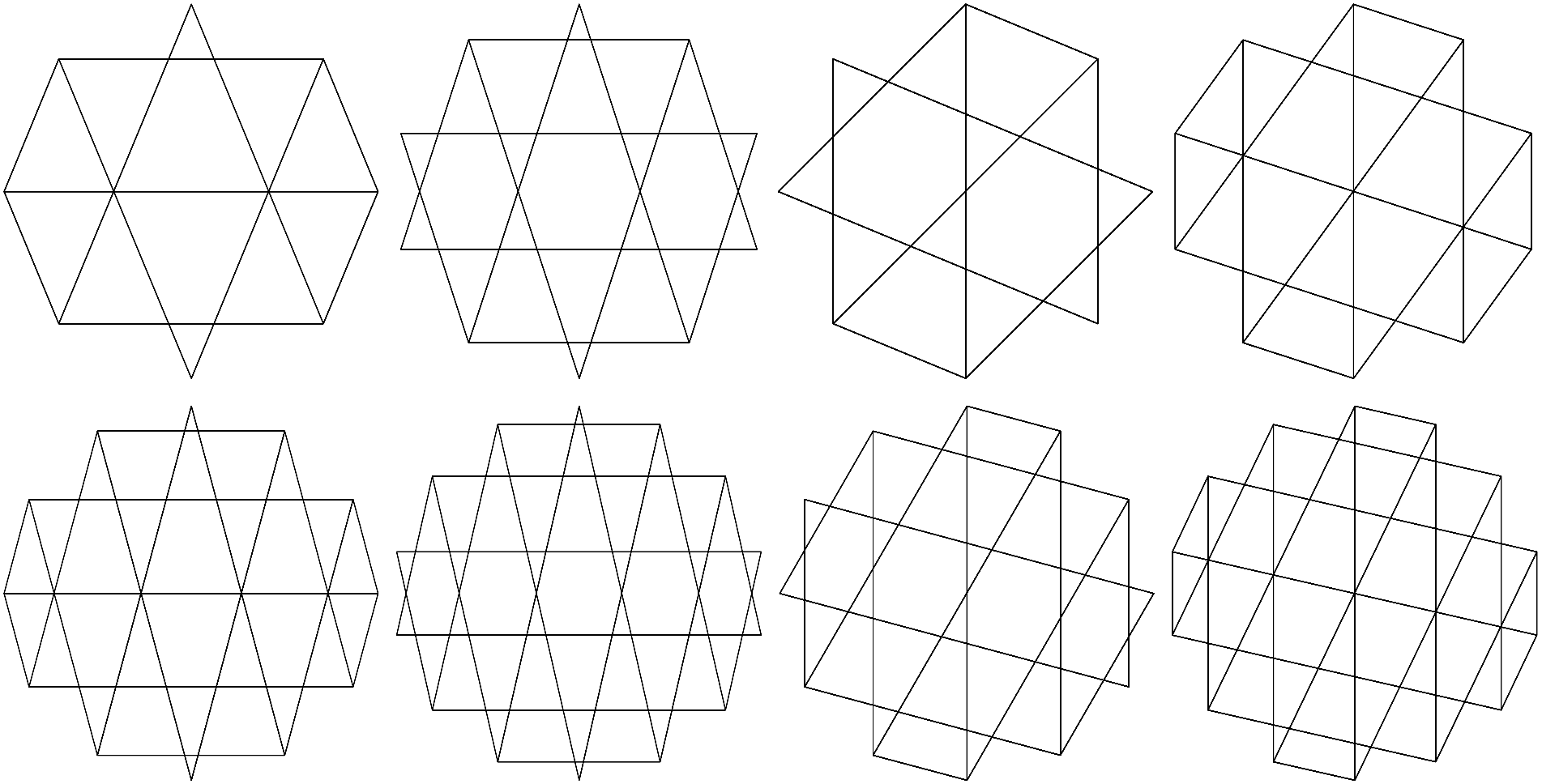
Sharpest Even Isosceles Triangles Images – Challenge Questions



The four columns represent four types of sharpest isosceles triangles on even polygons images, two with horizontal base and two with slanted base. The first and third are ***n*** = 4***k*** images and the second and fourth are ***n*** = 4***k***+2 images. The first row shows ***k*** = 2 and the second shows ***k*** = 3. (***k*** = 1 images (so ***n*** = 4 or 6) are possible but are less interesting from the perspective of seeing pattern development and are left to the reader because ***k*** = 1 produces isosceles right triangles and equilateral triangles images rather than sharpest apex triangles images.) **What are general formulas for the number of triangles, T, for each type of image?**

1. $T_{\underline{H}}(\boldsymbol{n} = 4\boldsymbol{k})$ 2. $T_{\underline{H}}(\boldsymbol{n} = 4\boldsymbol{k}+2)$ 3. $T_S(\boldsymbol{n} = 4\boldsymbol{k})$ 4. $T_S(\boldsymbol{n} = 4\boldsymbol{k}+2)$

3 Hints. ***i.*** These 8 images have been copied to a separate sheet of the *Sharpest Isosceles Triangles Excel* file to facilitate apex mark ups as described at the start of this chapter. ***ii.*** If you want to check your equations without looking in Chapter 20, ***k*** = 7 values are: ***n*** = 28, 1. 254, 3. 266; and ***n*** = 30, 2. 308, 4. 294. ***iii.*** If you prefer to use the *General Triangles* file, set ***j*** = INT((***n***-1)/2), ***k*** = ***j***+2, ***v*** = 1, ***w*** = ***n***-1 for horizontal images, and ***j*** = INT(***n***/2), ***k*** = ***j***+2, ***v*** = 2, ***w*** = ***n***-1 for slanted images.