1) We usually cut a pie as in figure (1) resulting in 6 pieces. We cut the pie using three (3) straight cuts.

![Figure 1 (Six pieces of pie)](image1)

However, if we cut as in figure (2), we can get seven pieces of pie instead of six with our three straight cuts. Never mind that the pieces we get are not the same size or shape. What is the most number of pieces—not necessarily the same size or shape—you can get by cutting a pie using five (5) straight cuts?

2) Using the whole numbers from 1 to 8, arrange them in the circles in the figure below so that no two circles with line segments connecting them have consecutive numbers in them.

![Figure 2 (Seven pieces of pie)](image2)

3) By changing one letter at a time in each position of the word, can you transform the word “WINTER” into the word “SUMMER” each step of the way using a sequence of letters that is an English word? An example of this would look like the sequence that transforms APE into MAN below:
4) A regular dodecahedron is a twelve sided figure with equal length sides and angles. Cut up a regular dodecahedron into pieces so they can be arranged into a square with the same area. The cuts in the figure on the right don’t come together as a square. They are meant to be an example of what we mean by cutting the dodecahedron up into pieces. You have to find what cuts would come together into a square when you rearranged them appropriately.

5) What is the area of the red region in the middle of the equilateral triangle? Assume that the three arcs are circular, and that they meet at the halfway point of the sides of the equilateral triangle.