FUNCTION RULE POLYGON ACTIVITY (# OF DIAGONALS)

1) **Fill–in the table below. It may help to draw a picture of the polygon to find the number of diagonals.**

Type of Polygon	Number of Sides	Number of Vertices	Number of Diagonals
Triangle	3	3	0
Quadrilateral	4	4	2
Pentagon	5	5	5
Hexagon	6	6	9
Heptagon	7	7	14
Octagon	8	8	20
Nonagon	9	9	27
Decagon	10	10	35

2) **Write the function rule D(v) to find the total number of diagonals depending upon the number of vertices of a polygon.**

Let v = Number of vertices in a polygon
D(v) = Total # of diagonals in a polygon of v vertices.

The formula $D(v) = \frac{v\,(v-3)}{2}$

3) **Find the number of diagonals if a polygon has 100 vertices. Show your work by using the function rule you found from #2.**
Replace 100 in for v:

$$D(v) = \frac{(100)\,((100)-3)}{2}$$

$$D(v) = \frac{(100)\,(97)}{2}$$

$$D(v) = \frac{9{,}700}{2}$$

D(v) = 4,850 diagonals in a polygon of 100 vertices.

V $V - 3$ $\frac{V \bullet (V - 3)}{2}$

# of Vertices	# of Diagonals Per Vertex	Total # of Diagonals (No Duplicates)
3	0	0
4	1	2
5	2	5
6	3	9
7	4	14
8	5	20
9	6	27
10	7	35