The Euler Number for Solids and Tic-Tac-Toe on a Torus
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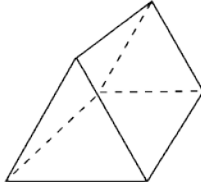
A. The Euler Number for Solids

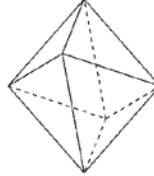1. Build the following solids; then find the number of faces, vertices, and edges of the following shapes:
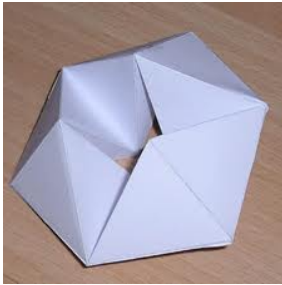
    a.   b.   c.

    d.

2. Complete the following table:

SHAPE	# of FACES	# of VERTICES	# of EDGES	F+V-E
a				
b				
c				
d				

3. Why does the fourth solid have a different Euler number? What is the difference between it and the other solids? What significance might the Euler number play for studying topology?

B. If we play Tic-Tac-Toe on a torus, what new moves become available?