A Note on the Skewness of a Graph

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The skewness $\mu(G)$ of a simple graph $G = (V, E)$ is the minimum number of edges whose removal makes the graph planar. We show that $\mu(G) \geq |E| - g(|V| - 2)/(g - 2)$ where g is the girth of G and find necessary and sufficient conditions for equality to hold. We use this to provide elementary proofs of the formulae of the skewness for many graphs including the complete graphs on n vertices K_n, the complete bipartite graphs on $m + n$ vertices $K_{m,n}$, and the n-dimensional cubes Q_n. We also explore the relationship between the skewness and crossing number of a graph.

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