

Ateneo de Manila University

Archium Ateneo

---

Mathematics Faculty Publications

Mathematics Department

---

2009

## Linear Operators that Preserve the Edgesum of a Graph

Ian June L. Garces

*Ateneo de Manila University*, [ijlgarces@ateneo.edu](mailto:ijlgarces@ateneo.edu)

Siegfred Alan C. Baluyot

Follow this and additional works at: <https://archium.ateneo.edu/mathematics-faculty-pubs>



Part of the [Mathematics Commons](#)

---

### Custom Citation

Baluyot, S., & Garces, I. (2009). Linear Operators that Preserve the Edgesum of a Graph. *The Loyola Schools Review*, 8, 39-47.

This Article is brought to you for free and open access by the Mathematics Department at Archium Ateneo. It has been accepted for inclusion in Mathematics Faculty Publications by an authorized administrator of Archium Ateneo. For more information, please contact [oadrcw.ls@ateneo.edu](mailto:oadrcw.ls@ateneo.edu).

16. J. N. G. Binongo, M. W. A. Smith, "The application of principal component analysis to stylometry," *Literary and Linguistic Computing* **14**, 445–66 (1999).
17. G. Gigerenzer, Z. Swijtink, L. Daston, T. Porter, L. Kruger, J. Beatty, *The Empire of Chance: How Probability Changed Science and Everyday Life* (Cambridge University Press, 1990).
18. X. Zhou, N. A. Obuchowski, D. K. McClish, *Statistical Methods in Diagnostic Medicine* (John Wiley & Sons, 2002).
19. F. J. Tweedie, R. H. Baayen, "How variable may a constant be? Measures of lexical richness in perspective," *Literary and Linguistic Computing* **32**, 323–352 (1998).
20. J. N. G. Binongo, M. W. A. Smith, "Statistical approaches to Philippine literature," *Philippine Studies* **45**, 500–538 (1997).

## LINEAR OPERATORS THAT PRESERVE THE EDGESUM OF A GRAPH

SIEGFRED ALAN C. BALUYOT  
I.J.L. GARCES

### ABSTRACT

Let  $\mathfrak{G}_n$  be the set of all simple (undirected) graphs with a fixed vertex set  $V = \{v_1, v_2, \dots, v_n\}$ . A mapping  $T : \mathfrak{G}_n \rightarrow \mathfrak{G}_n$  is a linear operator if  $T$  is closed under the union of graphs and  $T$  sends the null graph to itself. The edgesum of a graph  $G \in \mathfrak{G}_n$  is the minimum of all the sums  $\sum_{uv \in E(G)} |f(u) - f(v)|$ , where the minimum is taken over all numberings  $f : V \rightarrow \{1, 2, \dots, n\}$ . In this paper, we characterize all linear operators of  $\mathfrak{G}_n$  that preserve the edgesum.

**KEYWORDS:** linear operators, edgesum of a graph