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# Journal of Mathematical and **Fundamental Sciences**









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## Reference examples:

- [1] Sutasurya, L.A. & Riyanto, B., Title of Paper, Name of Journal, 8(1), pp. 20-25, Dec. 2005. (Journal)
- [2] Sutasurya, L.A., Handojo, A. & Riyanto, B., Title of book, ed. 2, Publisher, 2007. (Book)
- [3] Williams, J., Name of Paper, Name of Book, Name of the editor(s), eds., Publisher, pp. 67-69, 2006. (Book with paper title and editor)
- [4] Suharto (ed), Title of Paper, Name of Proc., pp. 5-10, 2008. (Conference Proceedings)
- [5] Name of the author(s), Title of paper (if available), Organization, URL Link, (1 April 2011). (URL Link)
- [6] Nicole, R., Title of Paper, Name of Journal, submitted for publication. (Pending publication)
- [7] John, K., Title of Paper, unpublished. (Unpublished manuscript)
- [8] Rashid, L., Title of Dissertation, PhD dissertation, Name of Dept., Name of Univ., City, 2010. (Thesis or Dissertation)
- [9] Jenny, P., Name of Institution, City, personal communication, 2010. (Personal communication)
- [10] Name of the author(s), Title of Technical Report, Technical Report TR-0334 (34-56), Name of Institution, City, Dec. 2009. (Technical report with report number)