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## Size Multipartite Ramsey Numbers for Small Paths vs. *K*<sub>2,n</sub>

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Abstract. Let G and H be finite graphs without loops and multiple edges. We use the notation  $K_{j\times s} \rightarrow (G,H)$  to mean that if the edges of the complete graph  $K_{j\times s}$  are coloured by the two colours red and blue, then either the red subgraph of  $K_{j\times s}$  contains a copy of G, or the blue subgraph of  $K_{j\times s}$  contains a blue copy of H. The size Ramsey multipartite number  $m_j(P_3, K_{2,n})$  is defined as the smallest natural number s such that  $K_{j\times s} \rightarrow (P_3, K_{2,n})$ . In this paper, we obtain the exact values of the size Ramsey numbers  $m_y(P_3, K_{2,n})$  and  $m_y(P_4, K_{2,n})$  for  $j \ge 3$ .

Keywords: Ramsey theory, Multipartite Ramsey numbers

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