ZMATH 2002d.03317

Hall, Richard D.G.

An analysis of errors made in the solution of simple linear equations.

Philos. Math. Educ. J., No. 15, 2 p. (2002).

This is an investigation into the errors made by pupils when solving simple linear equations. Data was collected from a final examination and analyzed with reference to recent literature. After finding three error types identified in the literature, six new error types not discussed in the literature were identified by the researcher. This constituted the pilot study. An expanded large-scale study employing the same methodology was carried out on a sample of 246 pupils' answers to between three and six linear equation questions, both to test the robustness of these six new error types and to find examples of the Transposing error mentioned in the literature. During this process the new data, and the 166 errors identified, was analyzed and, because of the nature of the new examination questions in this large-scale study, examples of the Transposing error were found and the unidentified errors were reduced to five. Thus nine error types appear in the analysis of the large-scale study. Three of these errors, Transposing, Switching Addends, and Division, are found to account for approximately three-quarters of the total number of errors. Transposing and Switching Addends errors are classified as structural errors, and mechanisms are suggested for their commission, both from the literature and from the experiences of the researcher. An interesting finding of this study, and one that may deserve further study, is that Transposing errors occur due to what may be oversimplification of the transposing process. Also, the Switching Addends error appear more frequently in 'algebraic' than in 'arithmetical' equations, and the resulting differing success rates confirm the findings of the literature on the difference in difficulty between these two types of equation. The findings of the large-scale study also highlight the importance of subordinate skills such as division, especially among younger pupils.

Classification: H33