

ABSTRACTS

GISELA CAMACHO, ASUMAN OKTAÇ. INVARIANT SUBSPACES: AN ALTERNATIVE FOR INTRODUCING EIGENVECTORS AND EIGENVALUES

Abstract. The concepts of eigenvalue and eigenvector are typically approached algorithmically in introductory linear algebra courses. However, a more conceptual orientation involves connecting these notions to the concept of one-dimensional invariant subspace, which allows for the introduction of eigenvectors prior to eigenvalues. In this study, we present data collected from interviews with two linear algebra instructors as they worked with a specific linear transformation in both paper-and-pencil and dynamic geometry environments. The data were analyzed using the perspectives of APOS theory and the theory of Mathematical Working Spaces in a complementary manner. The results indicate that dynamic representations facilitate the establishment of relationships between eigenvectors, eigenvalues, and invariant subspaces. This approach proves to have potential for developing a deeper understanding of the related concepts.

CATHERINE HOUDEMMENT, EDITH PETITFOUR. L'INFLUENCE DU COMPAS DANS UNE TÂCHE DE CONSTRUCTION GÉOMÉTRIQUE D'UN CERCLE.

Abstract. The influence of the compass in the geometric construction of a circle. This study follows on a semiotic and didactic analysis of a situation in which students (9-11 years old) had to draw a freehand diagram corresponding to a geometric figure. The figure is defined by a geometric text which specifies the relative positions of the circle and the square. The article looks at how the use of a compass could help students to succeed in drawing the figure. The didactic and semiotic analysis carried out sheds new light on the role of the compass in the geometric construction of a circle and on the knowledge that needs to be developed in order to lead primary school students to geometric learning through instrumented construction.

ILIADA ELIA, ANNA BACCAGLINI-FRANK, ESTHER LEVENSON, NANAE MATSUO, NOSISI FEZA, GIULIA LISARELLI. EARLY CHILDHOOD MATHEMATICS EDUCATION RESEARCH: OVERVIEW OF LATEST DEVELOPMENTS AND LOOKING AHEAD.

Abstract. In the present study, we provide an overview of the research in the field of early childhood mathematics education and identify the latest advances, new perspectives and gaps in the literature between 2012 and 2022. On the basis of our review of the international research literature published during this time span, in this paper we focus on five major themes of contribution: young children's number sense abilities and development, geometry education in early childhood, children's competencies in other content domains, teaching and learning mathematics in early grades with technology-integrated activities and early childhood teachers' knowledge, education and affective issues in mathematics. For each theme relevant research is discussed and directions for future research are provided.

FABIEN EMPRIN, PHILIPPE R. RICHARD. INTELLIGENCE ARTIFICIELLE ET DIDACTIQUE DES MATHÉMATIQUES : ÉTAT DES LIEUX ET QUESTIONNEMENTS

Abstract. Artificial intelligence and didactics of mathematics: current state and questions. It is essential to delve into the interactions between artificial intelligence (AI) and didactics, especially in our current era where the impact of AI on society and the economy is profound. Firstly, we question the concept of intelligence itself and the biases it may evoke when contemplating AI and its definitions. Next, we analyze the potential links between AI and the didactics of mathematics. To accomplish this, we examine examples of ongoing projects in the French-speaking world allowing us to provide an overview of the current developments. Subsequently, we explore the theoretical frameworks of mathematics didactics and their connection with AI. Lastly, we address the challenges and questions raised by the use of AI, while offering promising prospects for the future.

GHISLAINE GUEUDET. NOTE DE LECTURE: INQUIRY IN UNIVERSITY MATHEMATICS TEACHING AND LEARNING. THE PLATINUM PROJECT