A DYNAMIC INVESTIGATION OF NAPOLEON'S THEOREM

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TARGET AUDIENCE: Further Education & Training (FET) and Teacher Education.

DURATION: 2-hour workshop.

MAXIMUM NO. OF PARTICIPANTS: Dependent on number of computers - maximum of 2 per computer.

REQUIRED: Computer Lab with *Sketchpad* plus data projector, OHP and internet access.

MOTIVATION

This workshop involves a *Sketchpad* investigation from De Villiers (2003, pp. 119-121) aimed at secondary school mathematics learners and mathematics teachers that provides an opportunity for engaging them in some pattern recognition, generalising, conjecturing, and proof. During the activity participants may experience and understand some of the roles played by proof in mathematics such as verification, explanation, discovery and intellectual challenge.

CONTENT

The workshop will focus on a dynamic exploration of Napoleon's theorem, followed by a worksheet providing scaffolded guidance towards developing a logical explanation (proof). The activity provides a challenging, but accessible application of cyclic quadrilateral geometry. Overall, the workshop is intended to elicit some mathematical surprises and feelings such as "*How come? Why? I don't believe it - WOW!*" Participants will also be guided to some further generalisations and variations of Napoleon's theorem.

Refer to the separate worksheets for more information.

ABSTRACT

The workshop is aimed at the FET level and will focus on the discovery, proof and extension of Napoleon's theorem.

REFERENCE

De Villiers, M. (2003). *Rethinking Proof with Sketchpad*, Emeryville: Key Curriculum Press.

De Villiers, M. (2013). A dynamic investigation of Napoleon's theorem. In Z. Davis & S. Jaffer (Eds.), *Proceedings of the 19th Annual Congress of the Association for Mathematics Education of South Africa*, Vol. 2. (p. 18). Cape Town: AMESA.