

Exemplar 13: Simple Geometry

(Open-ended Question)

Learning Dimension: Measures, Shape & Space

Learning Units: (i) Simple Introduction to Deductive Geometry
(ii) Quadrilaterals

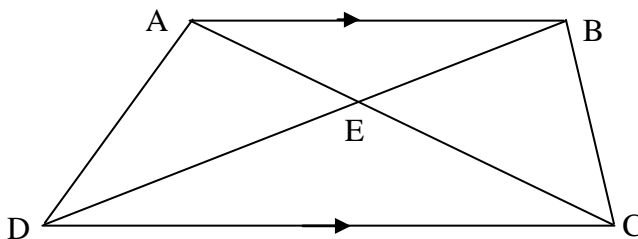
Key Stage: 3

Objective: To explore angles and areas related to rectilinear figures

Prerequisite Knowledge: Basic geometric facts relating to angles, parallel lines and triangles

Problem

ABCD is a trapezium with AB parallel to DC. Write down as many equalities related to the following figure as possible. Justify your answers. Your equalities may involve angles and areas of geometric figures.



Notes for Teachers:

This is an open-ended question. Students' performance in this question can be assessed on their ability to list ALL pairs of equal angles and the 3 pairs of triangles equal in areas with justifications. Teachers are free to adjust points, marks or grades assigned to students if they only list some pairs of equal angles and triangles equal in areas.

This exemplar mainly involves the following generic skills:

1. Communication Skills

- Describe findings and explain conjectures in written forms using mathematical language
- Formulate and write simple geometric proofs involving angles and triangles with appropriate symbols and reasons

2. Critical Thinking Skills

- Categorize information using various basic geometric facts, for example, locating equal angles related to parallel lines
- Reason deductively in the process of obtaining triangles equal in area

3. Problem-solving Skills

- Choose relevant information and geometric facts to solve problems
- Understand the problem by noting the important information given in the question
- Apply knowledge learnt to solve new problems, for example, two triangles are equal in area if they share a common base and have the same height