

UNIT 7 *Transformations*

Activities

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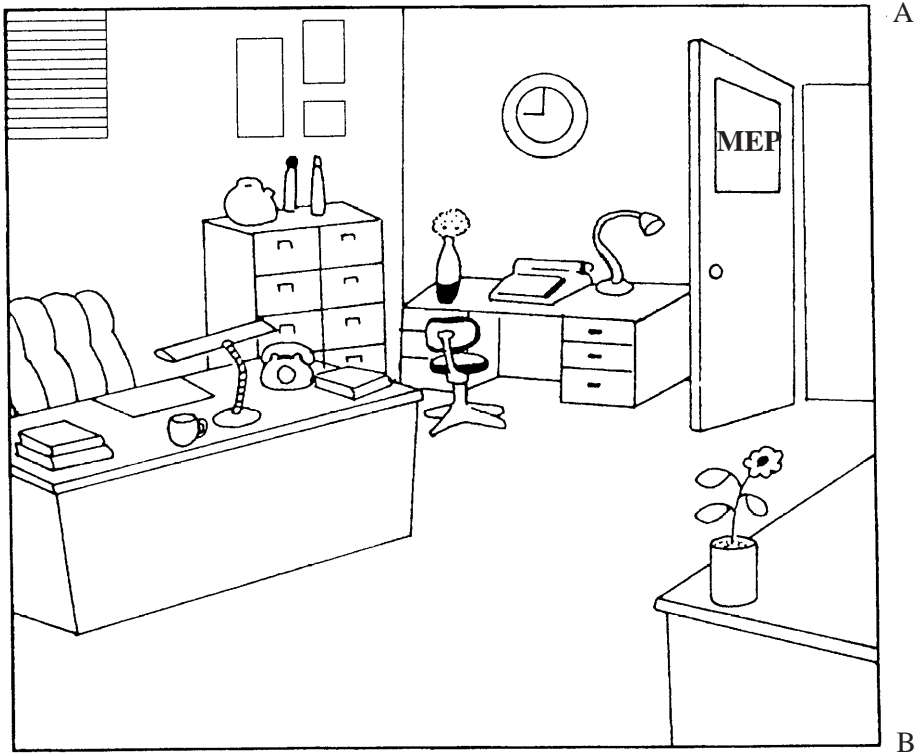
- 7.1 Reflections
- 7.2 Wallpaper
- 7.3 Repeated Reflections
- 7.4 Transformations
- Notes and Solutions (2 pages)

ACTIVITY 7.1

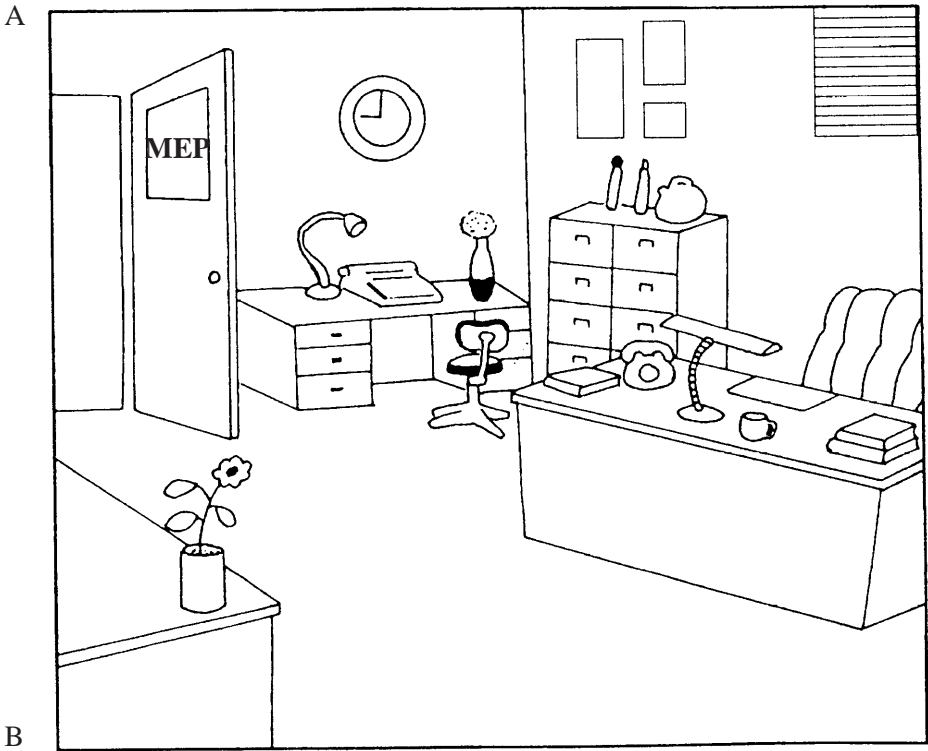
Reflections

Picture 2 should be the reflection of Picture 1 in the line AB. Circle the errors.

PICTURE 1

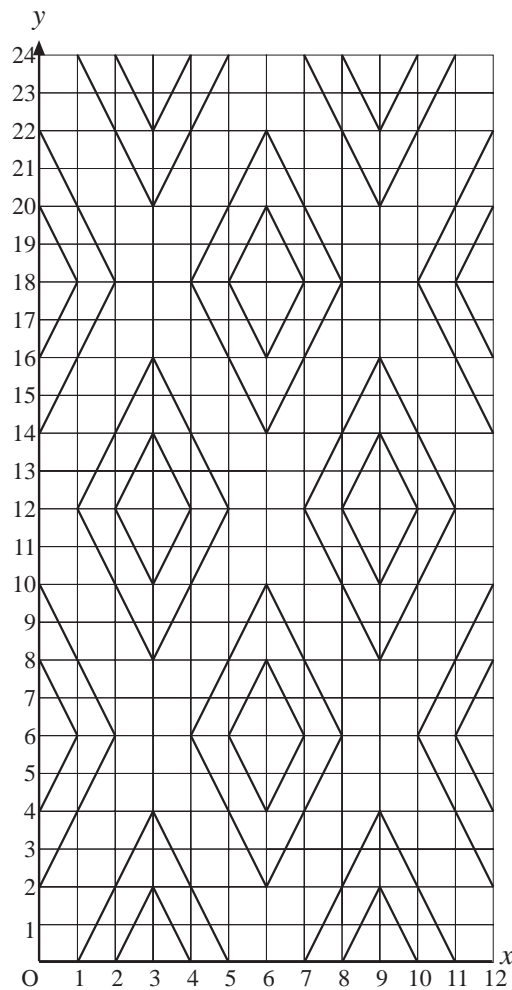


PICTURE 2



ACTIVITY 7.2

Wallpaper



The diagram shows a piece of wallpaper with a repeating pattern.

1. Describe how to obtain this sheet of wallpaper by starting with the line that joins the points with coordinates (2, 0) and (3, 2).

The origin (O) is at the point with coordinates (0, 0).

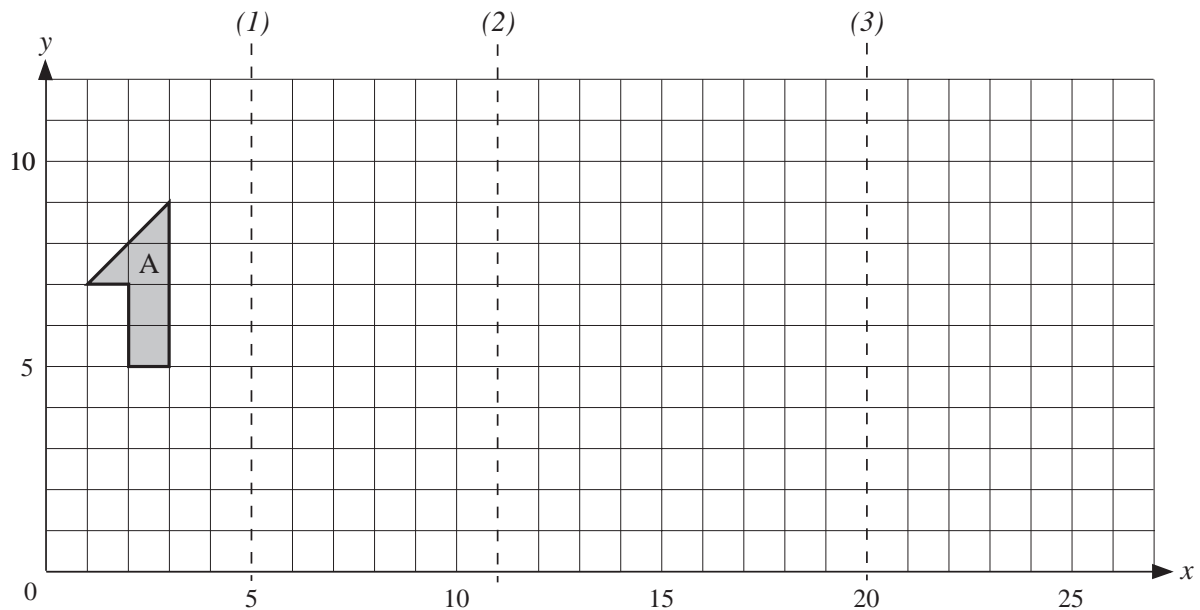
2. How many transformations are needed in total to complete the pattern on the grid $0 \leq x \leq 12$, $0 \leq y \leq 24$?

2. Design your own wallpaper pattern and describe instructions to obtain it from a single line or shape. Try to use a minimum number of transformations when repeating the pattern.

ACTIVITY 7.3

Repeated Reflections

The following diagram shows a shape, A, and mirror lines, 1, 2 and 3. Copy the diagram and then carry out the reflections and answer the question below.



- Step 1. Reflect *shape A* in *mirror line 1* and label it B.
- Step 2. Reflect *shape B* in *mirror line 2* and label it C.
- Step 3. Reflect *shape C* in *mirror line 3* and label it D.
- Step 4. *Shape D* can be obtained from *shape A* by just one reflection. Draw the required mirror line on your diagram and label it 4. What is the equation of this line?

Extension

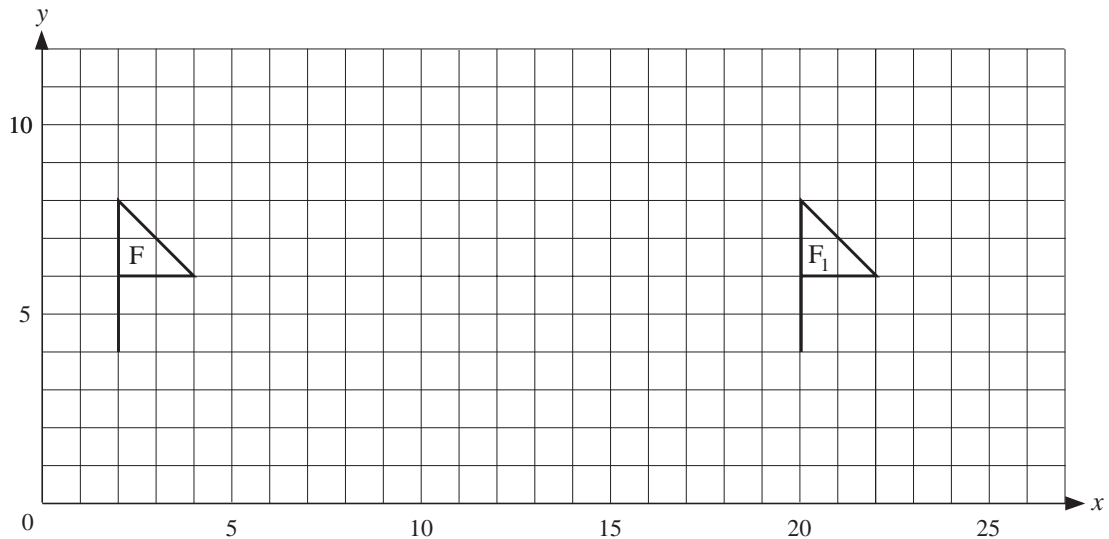
Repeat steps 1–4 on a new diagram using your own shape.

Does your answer to the question after Step 4 remain the same?

ACTIVITY 7.4

Transformations

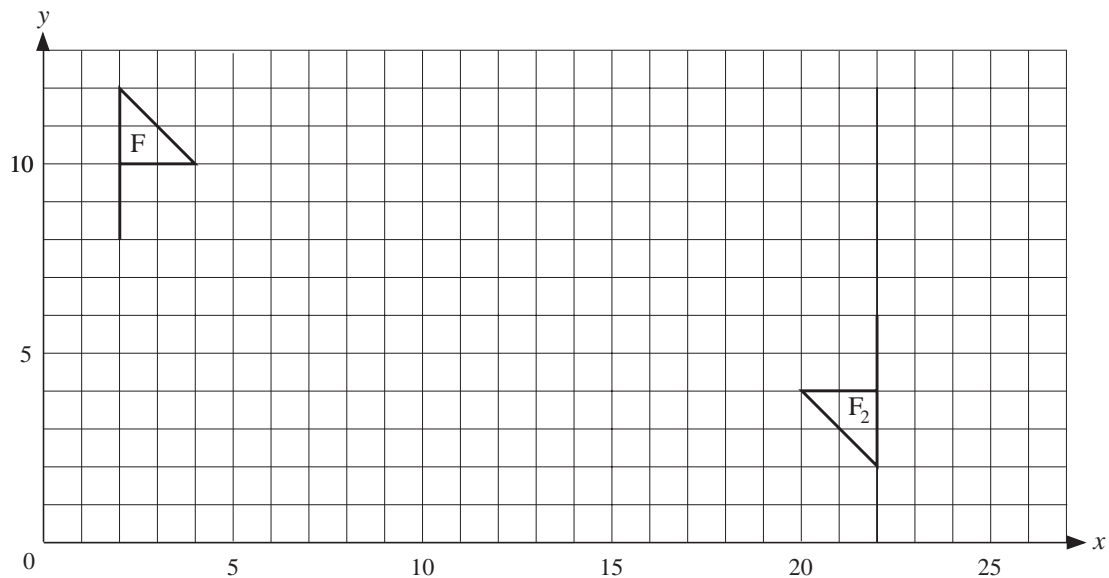
1. (a) F is mapped onto F_1 under a translation. What is the translation?



- (b) (i) Describe how F can be mapped onto F_1 using two successive reflections.
 (ii) In how many different ways can this be done?



2. (a) F is mapped onto F_2 under a rotation. Describe this rotation.



- (b) (i) Describe how F can be mapped onto F_2 using two successive reflections.
 (ii) Is your answer the *only* way that it can be done?