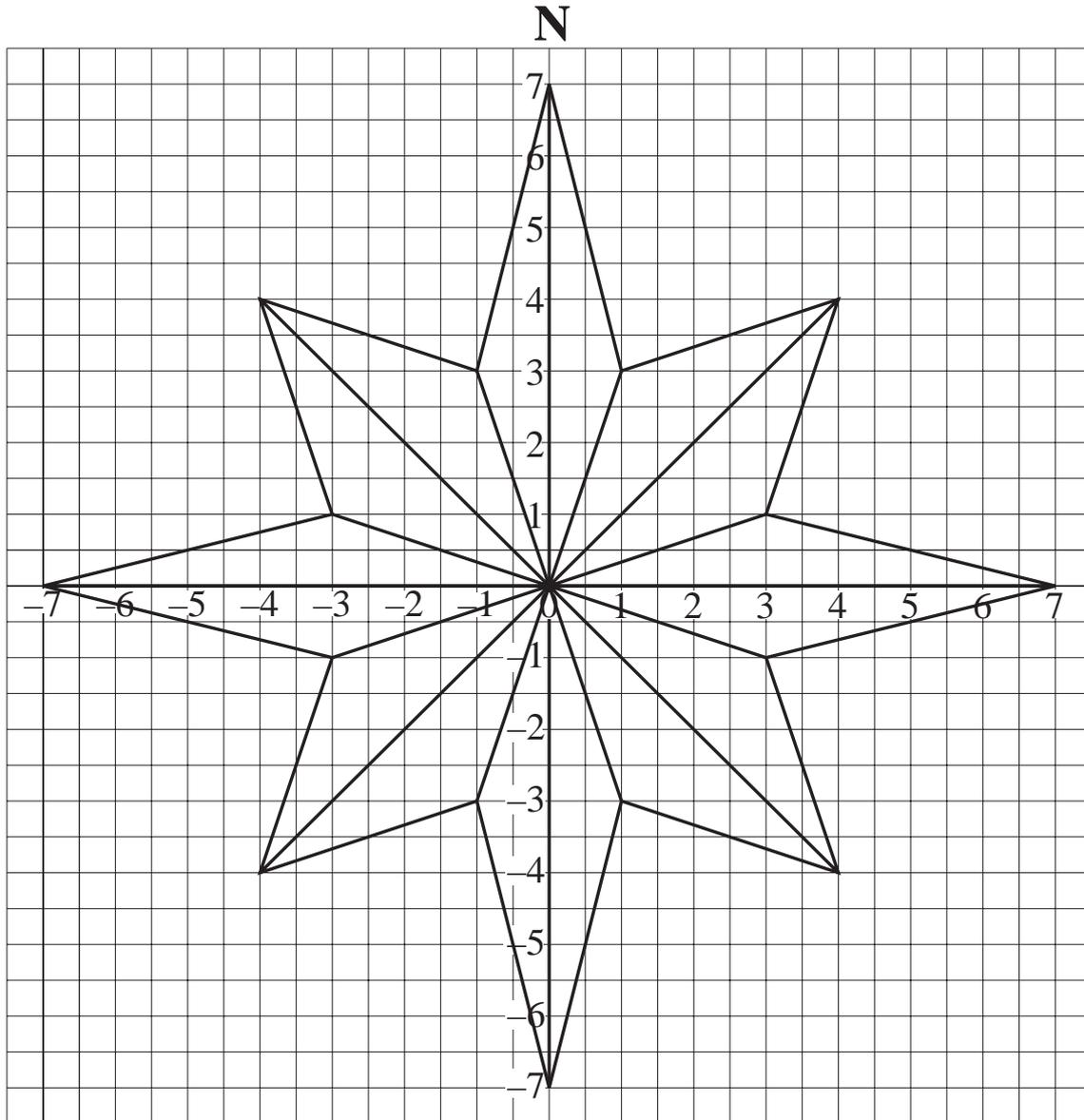


ACTIVITY 5.1

Compass Rose Construction

Here is a compass rose, symmetric about both the NS and the EW lines, so you can construct it using instructions for any one quarter.



1. Introducing coordinate axes, e.g. x in the E direction, and y in the N direction, as shown, what are the coordinates of the vertices of the rose in the positive quadrant?
2. Give a complete set of instructions for drawing all lines in the positive quadrant.
3. Give directions to now complete the diagram, using reflections.

Extension

Draw your own compass rose, giving a complete set of instructions for completing the drawing.

ACTIVITY 5.2

Sam Loyd's Dissection

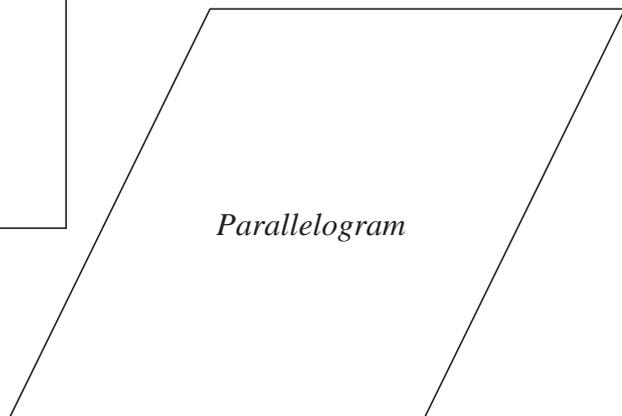
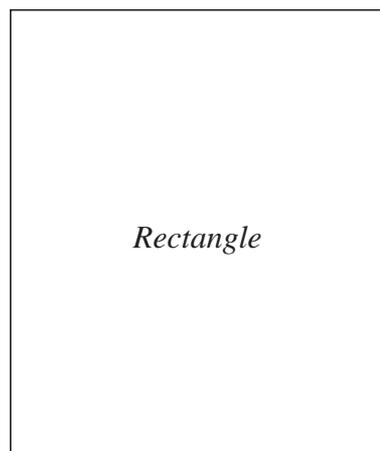
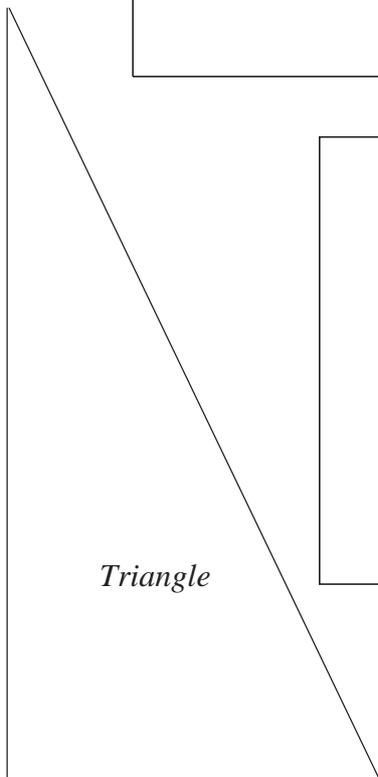
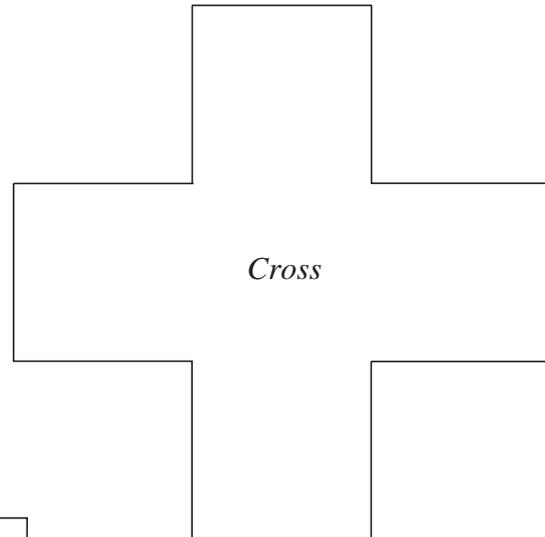
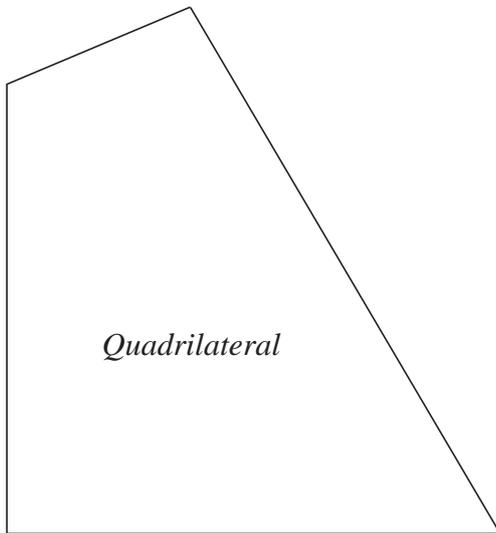
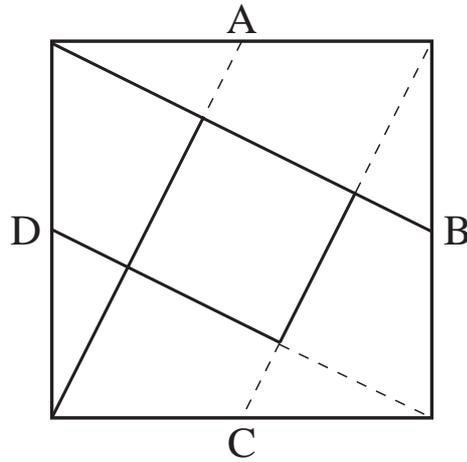
Sam Loyd's famous dissection problem was designed in the 1920s.

Draw a 5 cm square as shown on the right. Find the midpoints (A, B, C and D in diagram) on each side and join them up as indicated.

Using the diagram as a guide, cut your square into 5 pieces along the bold lines.

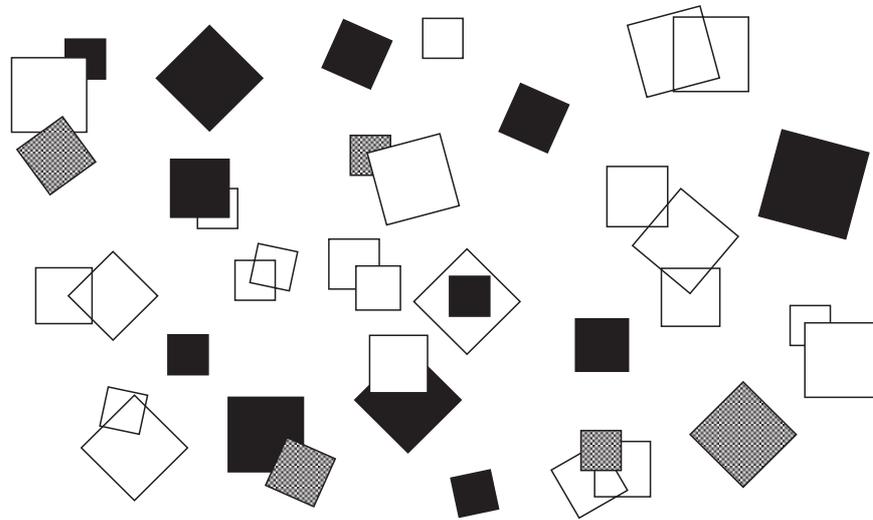
Do not cut along the dotted lines.

Use the 5 pieces to make all the shapes below.



ACTIVITY 5.3

Overlapping Squares



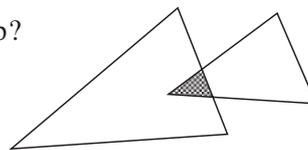
Take two squares and put them down on a surface so that they overlap. The squares can be of any size, not necessarily the same.

1. Which of the following shapes can be formed by the overlap:
 - (a) rectangle (b) square (c) kite (d) rhombus?

2. Can two squares intersect so that a triangle is formed by the overlap?

3. Can two squares intersect so that the overlap forms a polygon of n sides for values of n equal to
 - (a) 5 (b) 6 (c) 7 (d) 8 (e) 9 (f) 10?

4. What happens when two triangles overlap?



Extensions

1. What happens when two pentagons overlap?

2. What happens when two *different* shapes, e.g. square and triangle, overlap?

