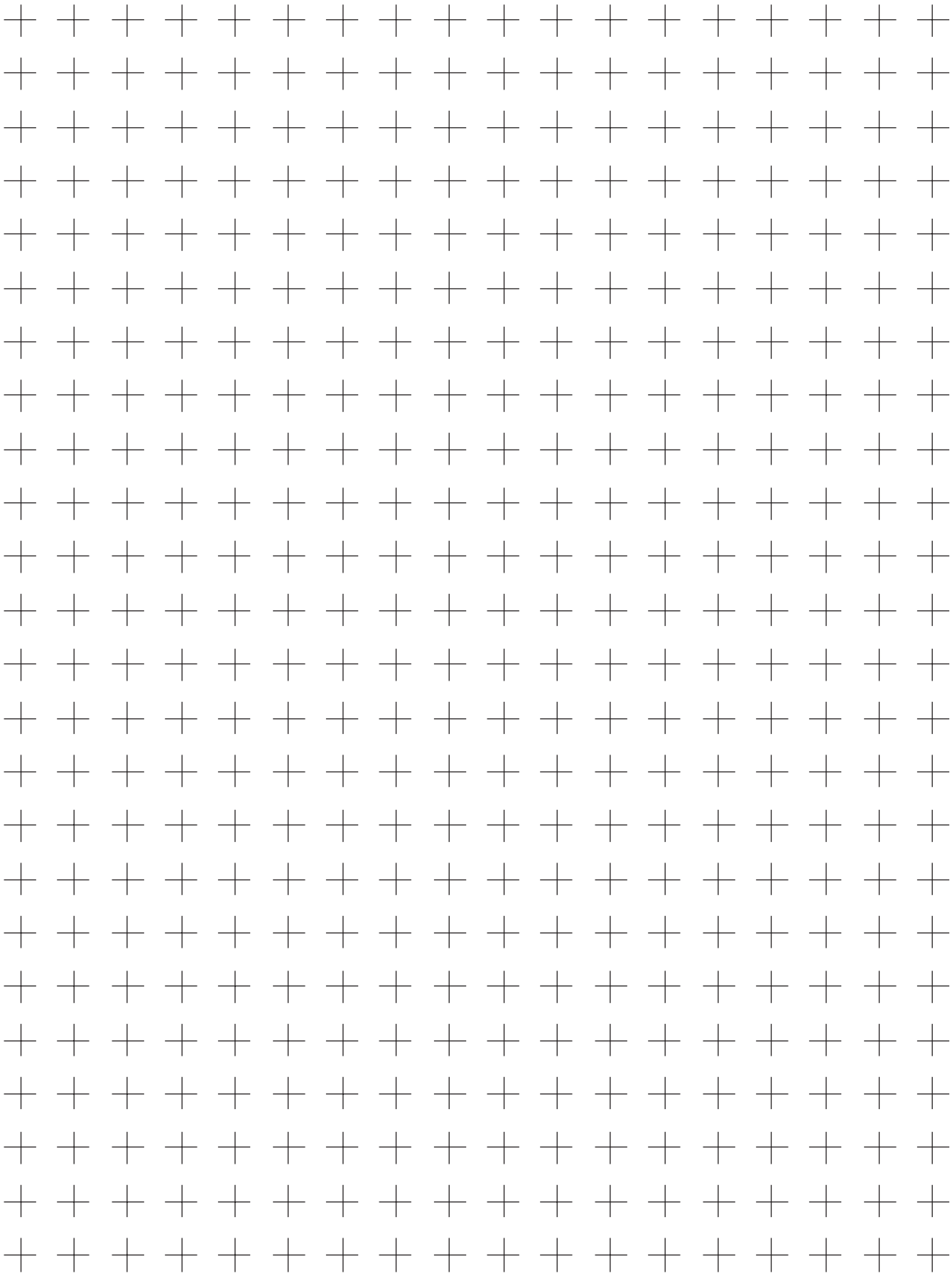
Grid Paper Explorations

with Henri Picciotto

For the first part of this session, you will work mostly on graph paper. You can use your own, or print out copies of the 1-centimeter grid paper from this packet (page 1).

For the second part of the session, you will work on the dot papers provided at the end of the packet, mostly the one on page 4.

If you don't have a printer, you should be able to do almost everything on your own graph paper. Unfortunately, if you don't have either a printer or graph paper, you can watch, but you probably won't be able to participate.



LAB 8.1 Name(s) _____

Polyomino Perimeter and Area (continued)

3. Experiment on graph paper or with the help of your interlocking cubes and fill out the following table.

Area	Minimum perimeter	Maximum perimeter
1		
2		
3	8	8
4		
5	10	12
6		
7		
8		
9		
10		
11		
12		
13		

Area	Minimum perimeter	Maximum perimeter
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		
25		
26		

4. Find a formula for the maximum perimeter, P_{max}, for a given area A.

5. Describe a pattern for the minimum perimeter.

6. What would the minimum and maximum perimeters be for the following areas?

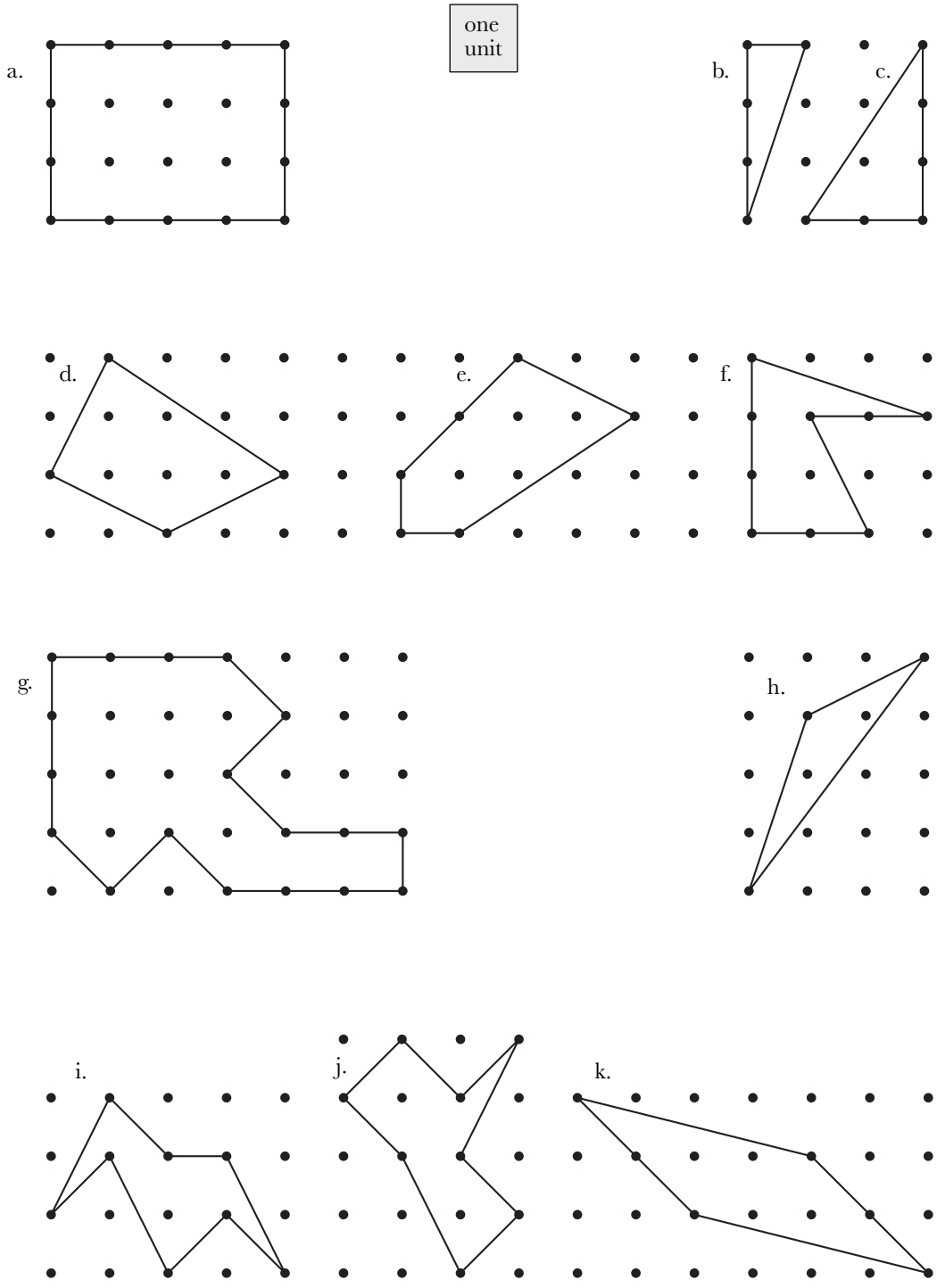
a. 49 min. _____ max. _____

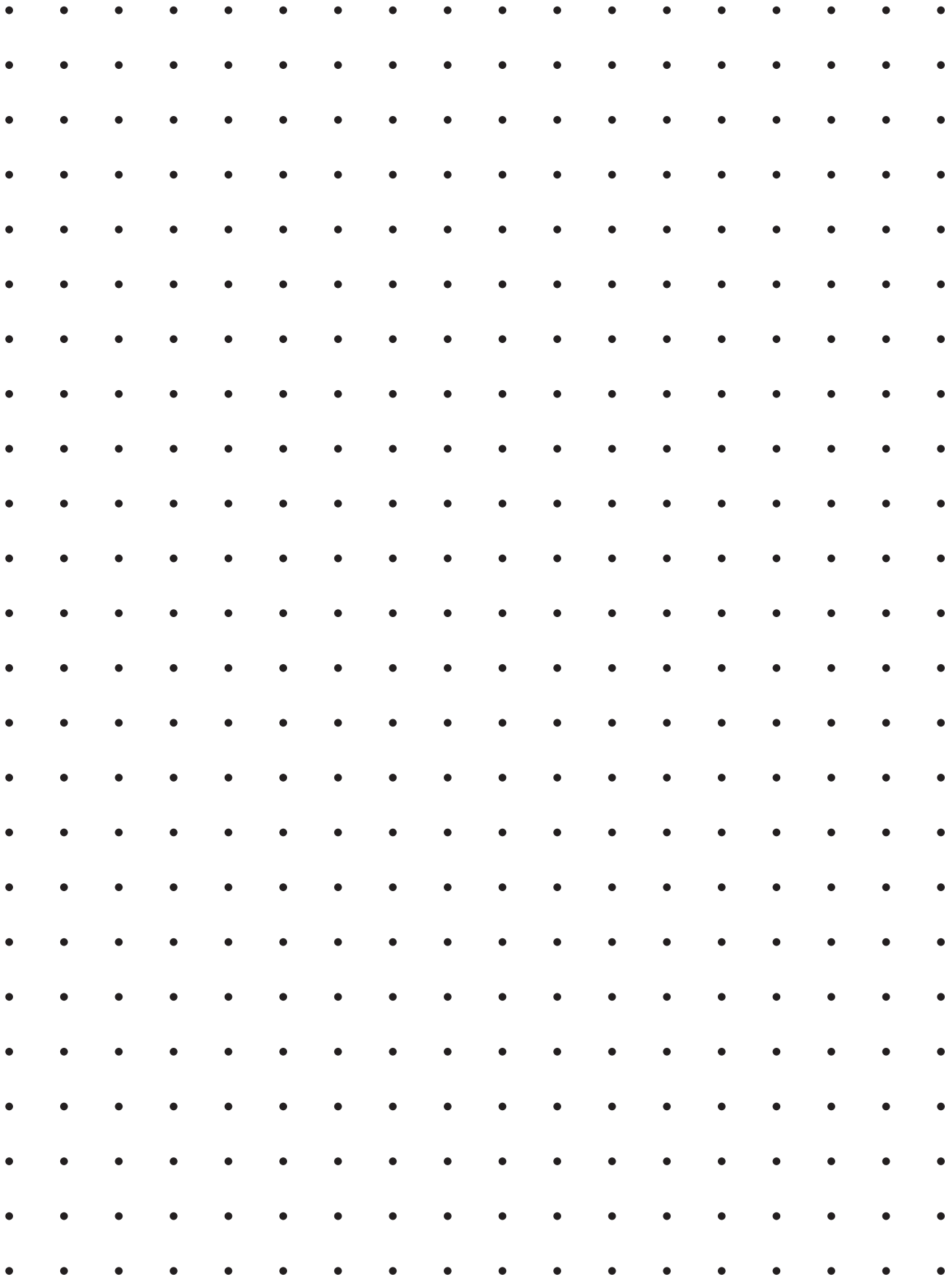
b. 45 min. _____ max. _____

c. 50 min. _____ max. _____

d. 56 min. _____ max. _____

Find the Areas





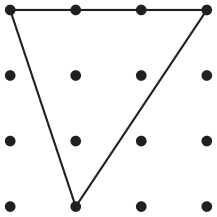
LAB 8.6
Pick's Formula

Name(s) _____

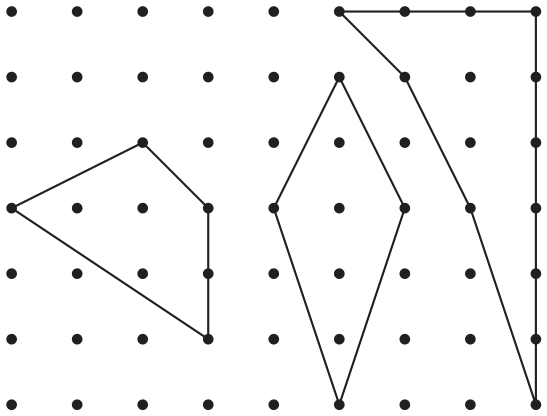
■ **Equipment:** Geoboard, dot paper

It is possible to find a formula for geoboard area as a function of boundary dots and inside dots.

For example, the geoboard figure at right has three inside dots and five boundary dots.



1. What is the area of the figure above?
2. What are the area, the number of inside dots, and the number of boundary dots for each of the figures at right?

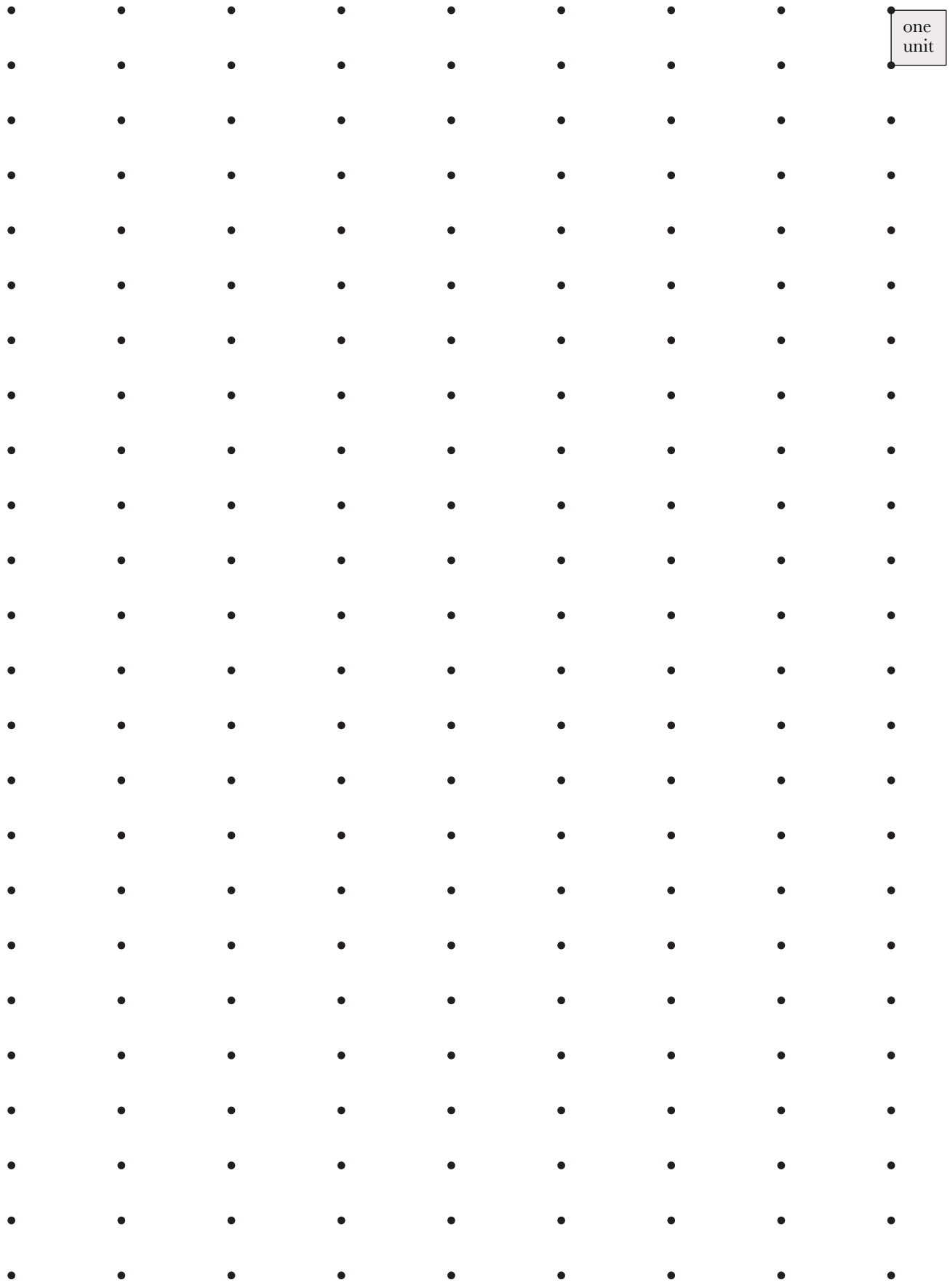


Experiment on your geoboard or on dot paper to find the formula. Keep track of your experiments in the table below. Problems 3–6 can help you organize your research.

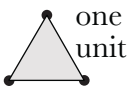
Inside dots	Bound. dots	Area

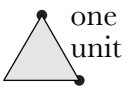
Inside dots	Bound. dots	Area

Inside dots	Bound. dots	Area



Rectangle Paper





Hexagon Paper