

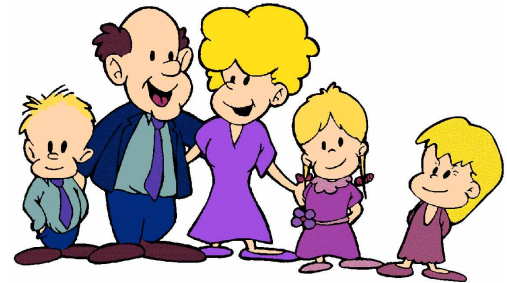
Emmy Noether - Circle 3 for 2007-2008

Part I: Problems

Problem 1

Use the numbers 2, 3, 6, 8, 33, 35, 85 to fill in the blanks in the story.

Bev and Mike have three children, John, Jennifer, and Robin. Bev is the oldest member of the family, age _____ years. Robin is _____ times as old as Jennifer, who is _____ years old. John is _____ years old, Robin is _____ years old, and their Dad is _____ years old. The sum of all their ages is _____ years.



Problem 2



Calculate and write the first five multiples of 99 in the chart given. What pattern do you notice in each column? Use this pattern to predict the next five multiples of 99. Add then to the chart. Check your predictions with a calculator.

Extensions:

1. Add to your chart the multiples of 99 from 11×99 to 15×99 . Use any new patterns you can see to predict and write the next five multiples of 99 (to 20×99). Check with a calculator.
2. Predict and write the multiples of 99 from 21×99 to 25×99 . Check with a calculator.
3. WITHOUT USING YOUR CALCULATOR, using the pattern you discovered in 1, predict the value of 89×99 .
4. Write the sum of the digits in each product. Describe the results.

	1000	100	10	1
1×99				
2×99				
3×99				
4×99				
5×99				

Problem 3

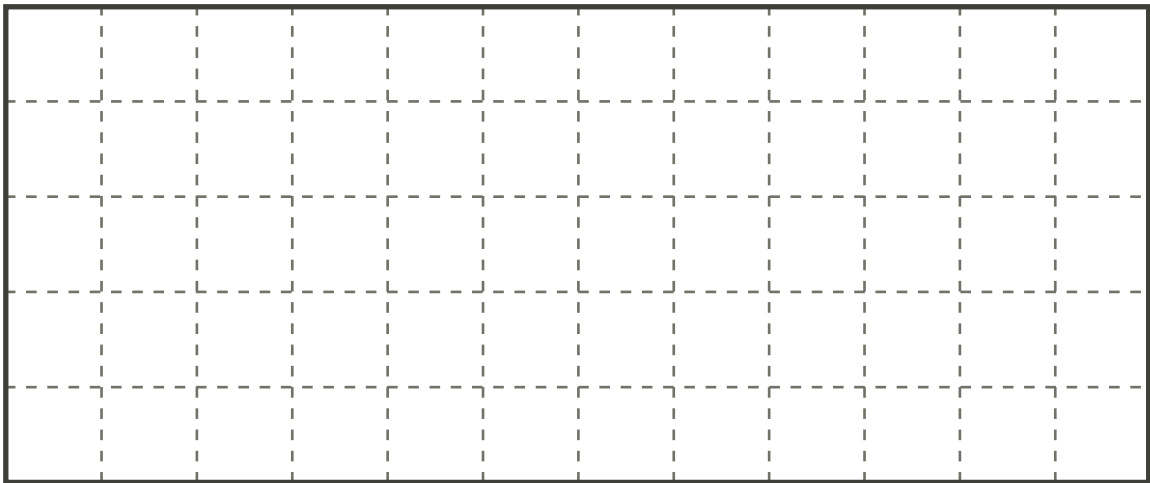
Aunt Sybil wants to plant herbs to sell at the market. The herb garden is to be a rectangular plot measuring 5 metres by 12 metres. She wants five different herbs, each in a square patch, as follows:

- a 1 m by 1 m square of rosemary;
- a 2 m by 2 m square of sage;
- a 3 m by 3 m square of thyme;
- a 4 m by 4 m square of basil;
- a 5 m by 5 m square of parsley.



Will all of these fit in her plot? Explain your reasoning, and sketch a plan for her garden if possible, using the grid below. How many square metres does Aunt Sybil have unplanted?

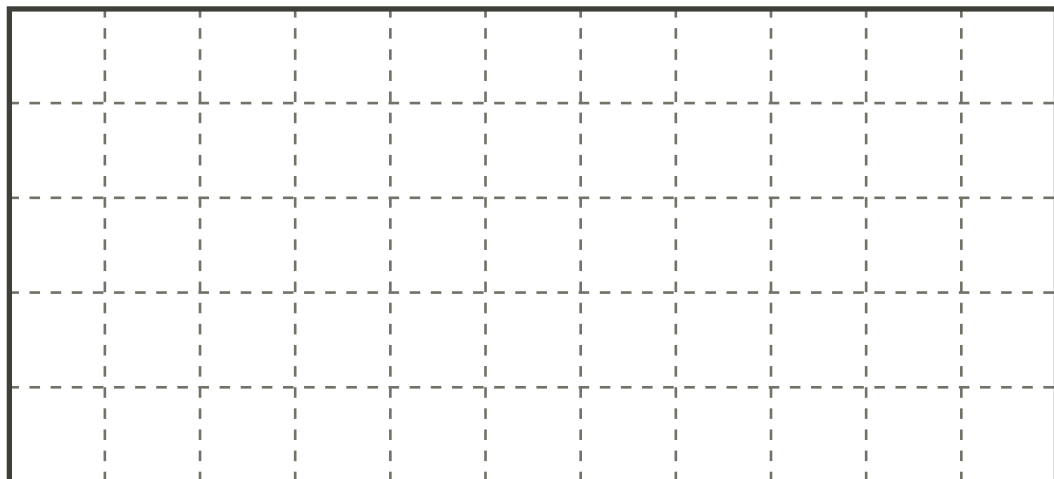
Plan for Aunt Sybil's Herb Garden (5 m by 12 m)



Extensions:

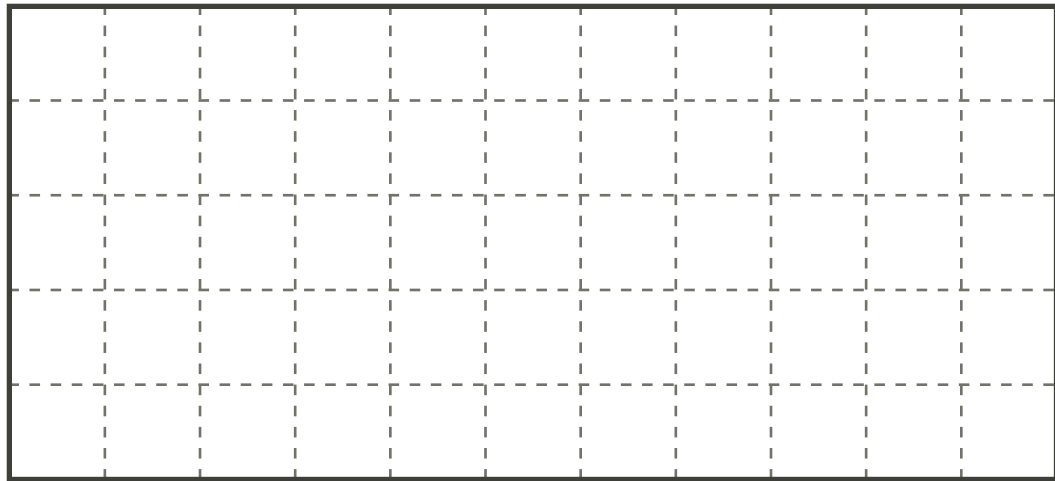
1. a) If Aunt Sybil's plot is only 5 metres by 11 metres, would her five square patches fit? Explain.

Herb Garden (5 m by 11 m)



- b) What if she decides the individual plots do not have to be squares, but must have the same areas as above? Can she then fit them into a 5×11 plot? Explain.

Herb Garden (5 m by 11 m)



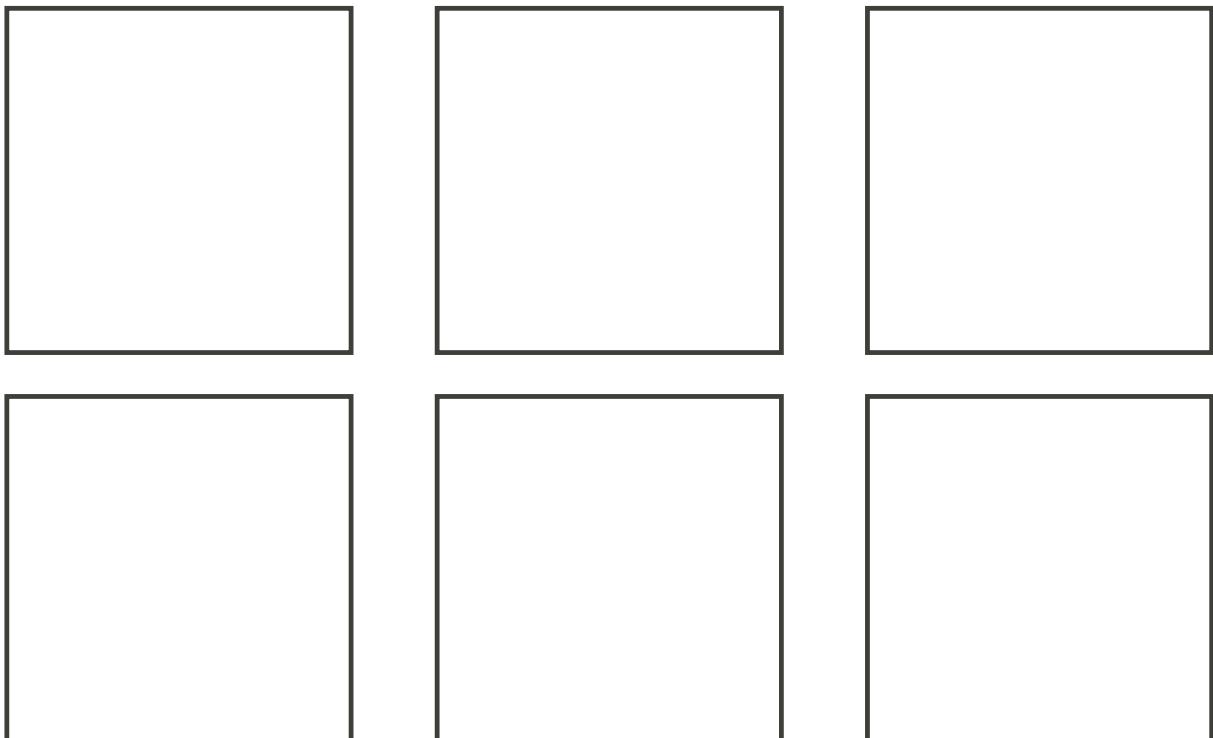
Problem 4

After a successful game of marbles with three friends, Lloyd says “If only I had one more marble, I would have four times as many as Akim, five times as many as Eli, and seven times as many as Ron.” What is the least number of marbles that Lloyd could have?



Problem 5

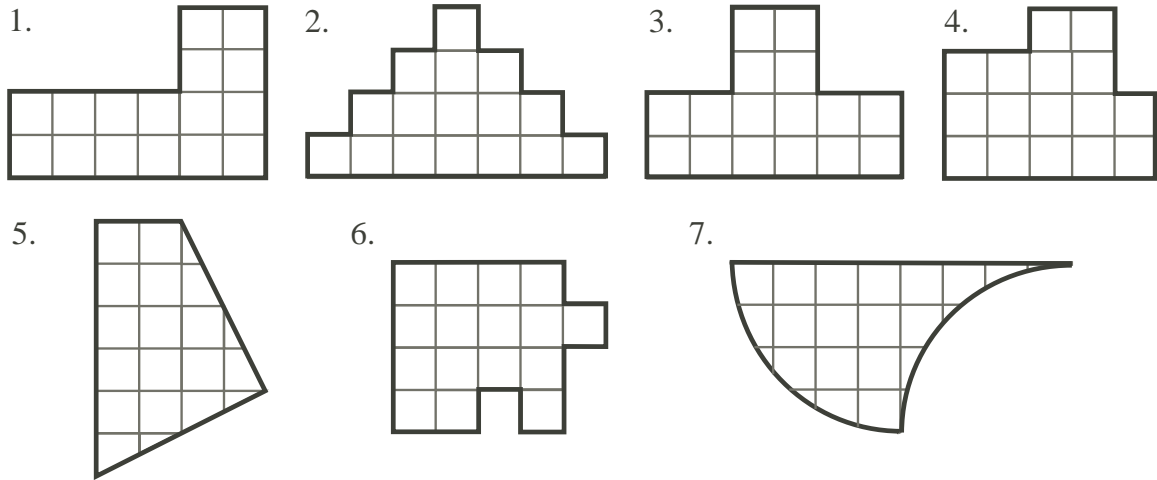
- a) Show six ways to divide a square into four congruent pieces, using only straight lines.



- b) See how many more ways you can discover.

Extension:

- For each template, discover whether four identical shapes of the same size could create a square. If so make a sketch showing how the four identical shapes create the square.



- Create a template of your own, four of which can be used to create a square.

Problem 6

LETS PLAY BALL! (suggested for teams of two to four students)

- In a Tigers versus Jays baseball game, the Jays scored a total of 9 runs. Use the given clues to fill in all the blanks in the score chart below.

Inning	1	2	3	4	5	6	7	8	9	Total
Tigers										
Jays										9

Clues:

- The Jays scored the same number of runs in the second, third and sixth innings.
- The Tigers scored the same number of runs in the second, fourth, and seventh innings.
- The Jays scored two more runs than the Tigers scored in the third inning.
- The Jays did not score in the other innings.
- The Tigers scored one fewer run than the Jays in the second inning.
- The Tigers scored four runs in the ninth inning.
- The Tigers did not score in any other inning.

- b) In the second game of the series, the Jays scored 1 run in the third inning, and did not bat in the bottom (last half) of the ninth inning because they were leading. The Tigers scored a total of 7 runs. Use the given clues to fill in the number of runs scored in each inning in the score chart below, and the total for the Jays.

Inning	1	2	3	4	5	6	7	8	9	Total
Tigers										7
Jays			1						No	

Clues:

- (i) The Jays scored the same number of runs in the first, third, and fifth innings.
- (ii) The Tigers led by one run at the end of the first inning.
- (iii) The Tigers scored runs in only three innings.
- (iv) The Jays scored one run less than the Tigers in the second inning.
- (v) The Tigers scored four more runs than the Jays in the sixth inning.
- (vi) The Tigers did not score in the remaining innings.
- (vii) In the eighth inning, the Jays scored the same total of runs as they had scored in the fourth and fifth innings combined.
- (viii) The Jays won by one run.



Extension:

Use the given score chart and create your own problem by completing the blank clues below.

Inning	1	2	3	4	5	6	7	8	9	Total
Tigers										
Jays										

Clues:

(i) _____

(ii) _____

(iii) _____

(iv) _____

(v) _____

(vi) _____
