Problem solving week

Second class

Warm up

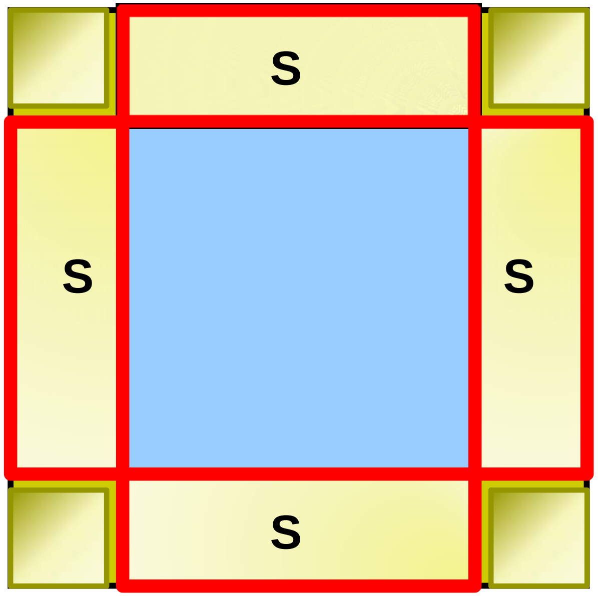
- Explain to your group members how you got your alternative solution to the pool border problem.
- Write in your notes every question you were asked by your group members about your solution.
- To think about:
  - Do you think your answers convinced them that your solution is correct?
  - How would you verify that they understood your solution?

Pool border problem

- Solution we obtained to the pool border problem was

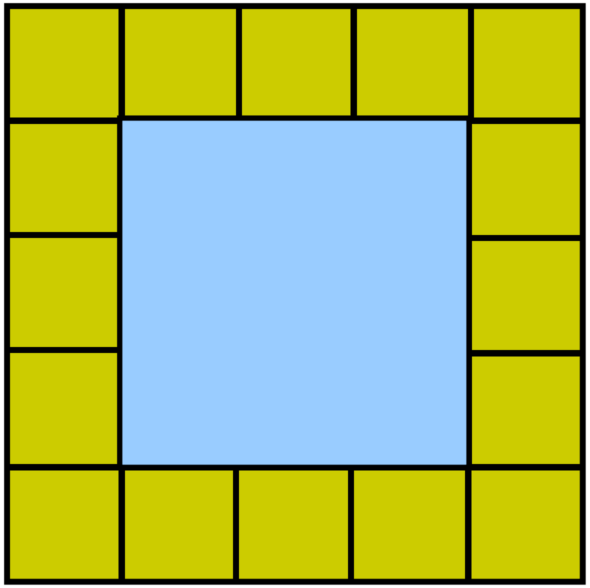
  S+S+S+S+4

I can represent this on our diagram as follows:



Pool border problem

- Pictorially explain how each of these solutions was obtained:
  - 4(n+1)
  - 4n+4
  - 2n+2(n+2)
  - 2n+2n+4
  - 4(n+2)-4



My survey

- “I want to learn how to teach math”

31

- I want to have a solid understanding of math concepts.

3

Comments

- Calculators
- Practicum
- Portfolio
- Work load

Interesting number

- The Indian mathematician Ramanujan observed that the taxi number 1729 was very interesting because it was the smallest counting number that could be expressed as the sum of cubes in two different ways. Find the numbers whose cubes added give you 1729.

Strategies used?

- Trial and error
- Make a list of cubes
- Create a formula (to use in trial and error)

Lakes

- The surface of Big Lake is 31 feet above the surface of Long Lake. Long lake is half as deep as Big Lake and the bottom of Long Lake is 8 feet below the bottom of Big Lake. How deep is each lake?

Strategies?

- Draw a picture
- Make a list of what I know and what I need to know
- Write an expression that corresponds to our situation
- Label

Points on a circle

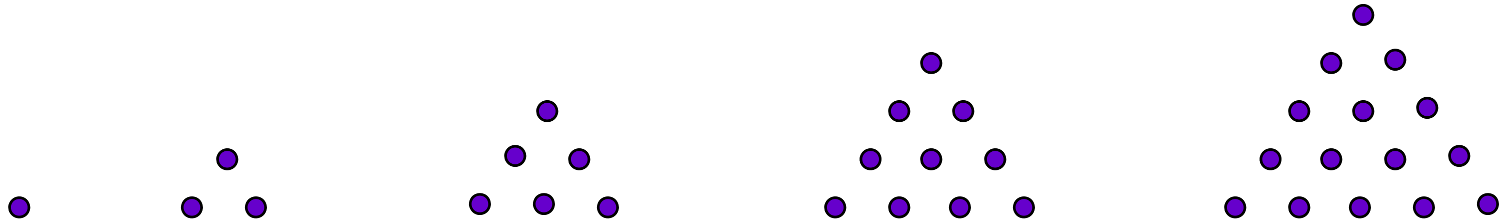
- If 20 points are placed on a circle and every pair of points are joined with a segment, what is the total number of segments drawn?
- What if n points were placed on a circle?

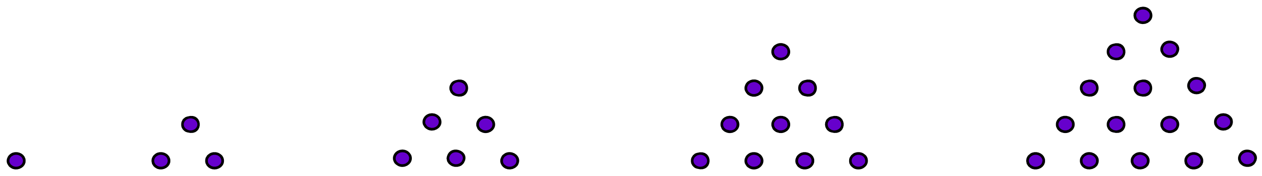
Strategies used?

- Draw a picture
- Write an expression
- Count
- Look for pattern
- List
- Try a simpler case

Triangular numbers

- The triangular numbers are the whole numbers represented by certain triangular array of dots. The first five triangular numbers are





- Make a sketch to represent the seventh triangular number.
- How many dots will there be in the 10th triangular number?
- Is there a triangular number that has 150 dots in its shape?
- Write a formula for the number of dots in the nth triangular number.
- Find the sum 1+2+3+4+ … +100

Strategies used?

Recipe?

- Is there a recipe for solving problems?
  - No, but …

- Is there a general outline one might use when approaching the problem?
  - Make sure you understand the problem
  - Devise a plan
  - Carry it out
  - Look back

Strategies

- Guess and check
- Draw a picture/diagram
- Use a variable
- Make a list
- Look for a pattern
- Solve a simpler problem
- Use direct reasoning
- Work backwards
- Use cases
- Look for a formula ……

Ongoing assignment

On the course wiki we will develop **Problem solving** document. As you are solving problems, give your strategy a name and list with it when you think this may be a good strategy to use together with an example that you used it for.
Example:

STRATEGY	CLUES
• Draw a picture/diagram	• Geometric figures are involved • We can visually represent the problem • There are measurements given

Come back and add clues and strategies.
Come back and look for inspiration if you get stuck on a problem.
Password is : **elmath**

Individual work – cookie jar problem

There is a jar with cookies on the table. Amanda walked in and ate half since she hadn't had breakfast that morning. Rodney walked in afterwards and took a third of what was left over. Natalie was going to her next class, noticed the cookies and decided to take fourth of them with her. Jerilee dashed in and grabbed a cookie to munch on. When Jamie looked into the jar there were only two left. "How many cookies were there to begin with?" she asked.