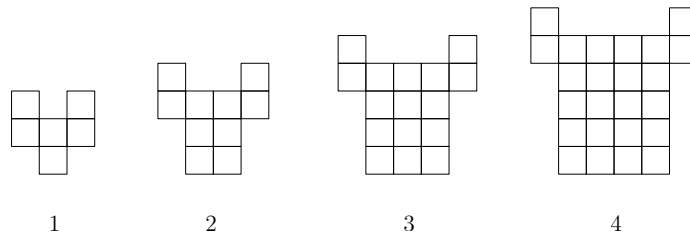


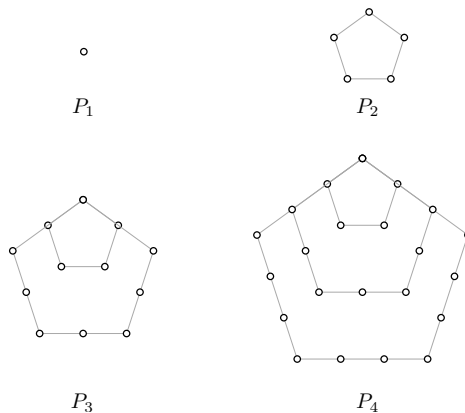
Practice 1.4 (October 10)

Link to the poll: <https://goo.gl/forms/CDXubqHnFvwBynnj1>. Closed: Monday 9, 10 pm.

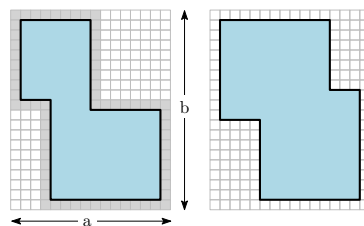
1. Lucy opened her moneybox and spent half of the money in a trip. After that, she spent 36 euros in a dress and then she had 25 euros left. How much money was there on the moneybox?
  - a) Write an equation that can be used to solve the problem.
  - b) Think in a procedure that could be used by a 10 year old kid.
2. Write five “generic” consecutive multiples of 7 and show that their sum is always a multiple of 5.
3. How many squares does the next figure have? And the 10th one? The  $n$ -th one?



4. The number of points in the figures are called *pentagonal numbers*. The 2nd pentagonal number,  $P_2$ , is 5. Can you find the 5th pentagonal number,  $P_5$ ? And the 10th one,  $P_{10}$ ? And the  $n$ -th one,  $P_n$ ?



5. We want to tile the floor around the swimming pools of the picture, as in the left example. How many tiles will we need? (Take  $a$  and  $b$  as the unknown dimensions of the rectangle).



Sigue a la vuelta

6. © Is 667 a prime number? And 673?

When can you stop to look for divisors in order to convince yourself that 673 is prime? Why?

7. Adapt the Erathostenes sieve in order to find all prime number bigger than 220 and smaller than 250.
8. Find three examples of numbers with an odd number of divisors. Can you see a property that have all numbers that have an odd number of divisors?
9. Knowing that  $69\,972 = 2^2 \times 3 \times 7^3 \times 17$ ,
- a) how may divisors does the number 69 972 have?
  - b) find all odd divisors of 69 972.
  - c) how many divisors of 69 972 are multiples of 28?
10. In a high school there are 100 lockers, with numbers from 1 to 100, and there are also 100 students numbered from 1 to 100. Student number 1 goes and opens all lockers. Next, student number 2 goes in and closes all lockers with even numbers. In the general step, student number  $k$  *changes the state* (opens the locker if it was closed and closes it if it was open) of all lockers labeled with a multiple of  $k$  (and ignores the rest). Which lockers will be open after student number 100 does that?