

Practice 1.5 (October 18)¹

You have to fill this poll <https://goo.gl/forms/taeaUUBDWUVVTVIi1> before Monday 17, 10 pm. (For problems 7-10 it is convenient to wait till Monday, after the theory class).

1. © 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?

2. Find all prime number bigger than 200 and smaller than 230.
3. 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?
4. Knowing that $5720 = 2^3 \times 5 \times 11 \times 13$,
- how may divisors does the number 5720 have?
 - find all odd divisors of 5720.
 - how many divisors of 5720 are multiples of 22?
5.
 - Find the smallest number for which 140 has to be multiplied in order to get a perfect square.
 - Find the smallest number for which 360 has to be multiplied in order to get a perfect cube.
6. Find three numbers that have 6 divisors. What is the smallest number that has 6 divisors?
Repite the problem for numbers with 12 divisors.
7. Find all common divisors of 3300 and 1170.
8. In the boundary of a trapezoidal field with sides measuring 72, 96, 120, and 132 m we have planted equally spaced trees. Compute the number of planted trees, if we know that there is one in each vertex and that the distance between consecutive trees is as big as possible.
9. I was given a bag full of equal coins, and I was told that if I shared the coins between 6 friends, the remainder would be 5, if I shared the coins between 14 the remainder would be 5 and if I shared them between 16 friends the remainder would be also 5. Furthermore, I know that the bag has more than 500 but less than 1000 coins, how many coins are there in the bag?
10. Three satellites orbit around the earth. The first completes a full turn every 15 hours, the second one every 21 hours, and the third one every 35 hours. Tonight at 2 am they will coincide in the sky.
- When will they coincide again?
 - If I observe the sky again after exactly 60 days, how long will it take to see them coincide again? (January 2013)

¹All problems should be made without using a calculator. In the future, problems meant to be solved with the help of a calculator will be marked with the symbol ©.