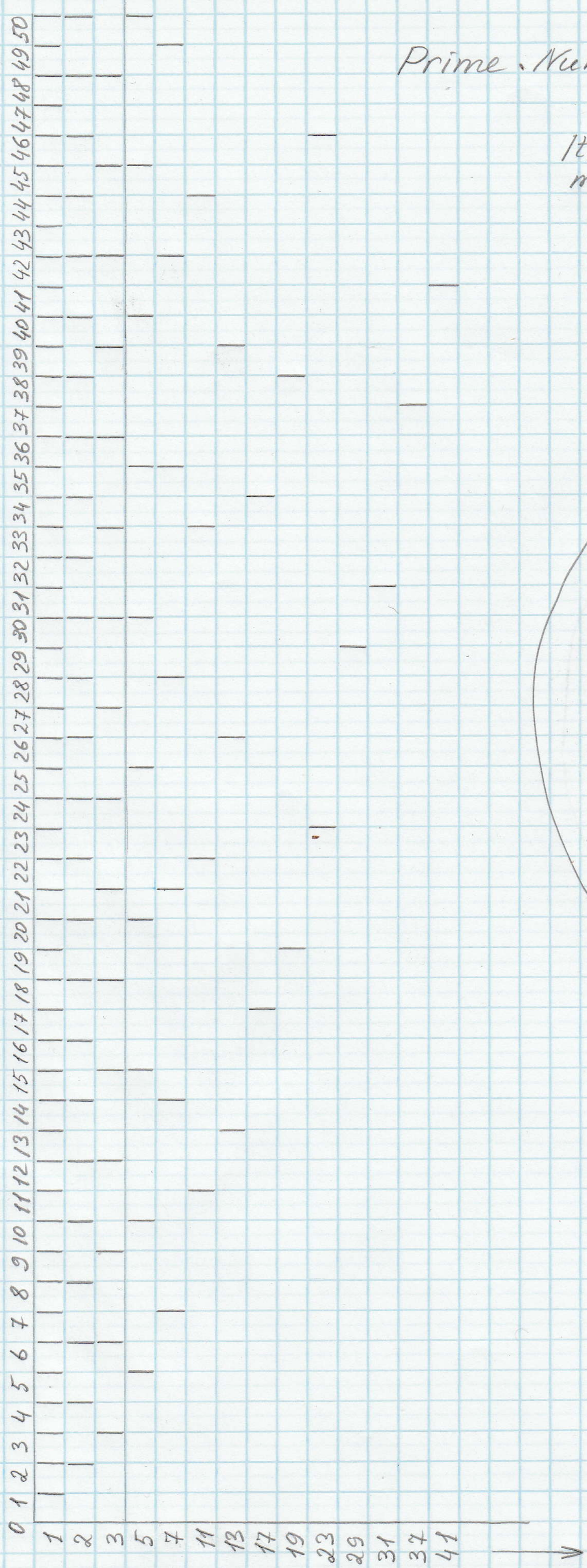
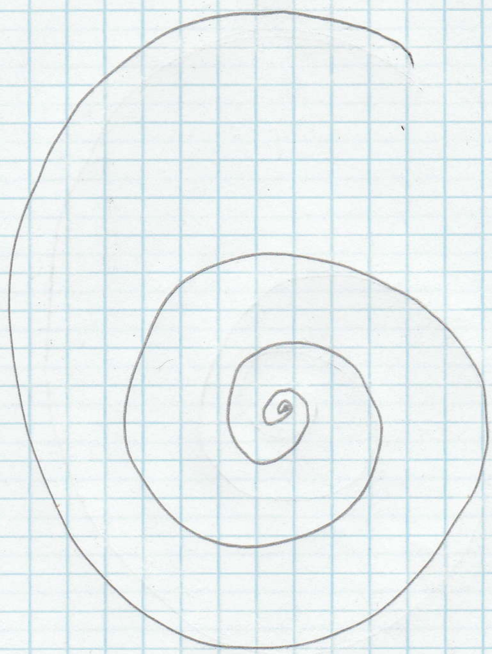
Prime Number Explanation.

Its nature, appearance, types, movement, prediction.





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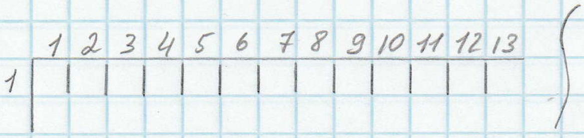
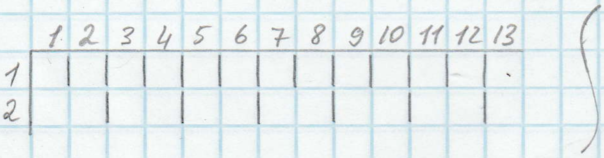
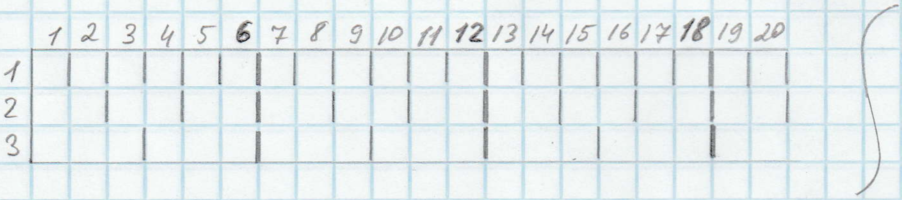


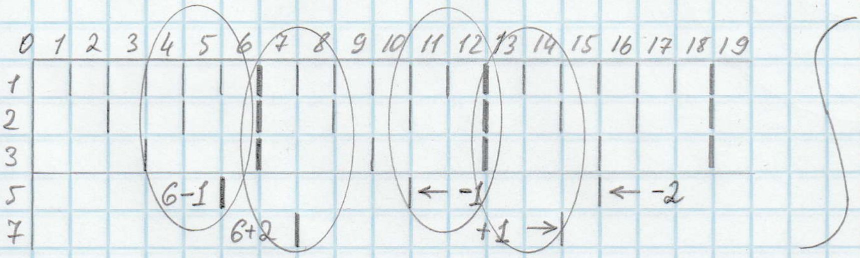
We take the number 1, we represent a series of such numbers. Definitely, any natural number $n > 0$ consists of 1, hence is in this series.



Let's represent a series of the next number not being the previous one, but larger $1+1=2$ below.



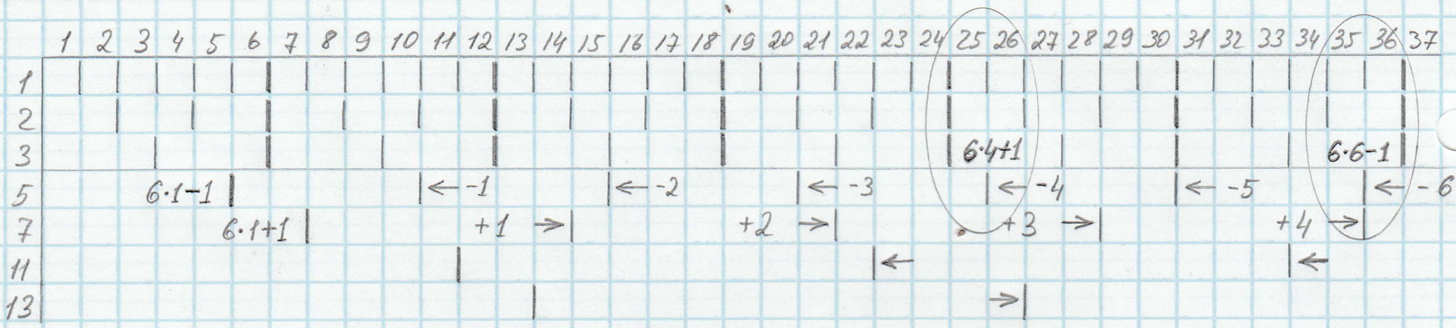
Let's represent a series of the next number not being the previous, but larger $2+1=3$ below. Obviously, a new internal series of $2 \times 3 = 6$ was formed, thus forming a kind of static numerical base. Hence any number of the form $1n$, $2n$, $3n$, $(6n)$ will be in this number strip.



Obviously, the numbers for the subsequent series not being the previous 1, 2, 3, 6 and derived from them $2n$, $3n$, $(6n)$, except $1n$, can only be of the form $6n \pm 1$. Even for $n = 0$, $6 \times 0 + 1 = 1$, but 1 has already been taken.

It is also seen that the new numbers are dynamic, the number $6-1$ moves left by 1 with each step, and the number $6+1$ is similar to the right. Consequently, such a displacement periodically leads to overlapping of the numbers $6n \pm 1$, thereby leading to the impossibility of the appearance of numbers for new series different from previous ones and not produced from them.

As a consequence, we can select several types of primes: initial (prime) number is 1, the base primes are 2, 3 and the dynamic primes are $p \geqslant 5$.



Observing the motion, we can notice that the dynamic prime numbers will be periodically multiples of the basic prime numbers and the numbers $6n \pm 1$.

So 5 ($6\times1-1$) will close through 4 steps $6n+1$, $5+5+5+5+5=25$, after 2 more steps $6n-1$, $25+5+5=35$ and so on.

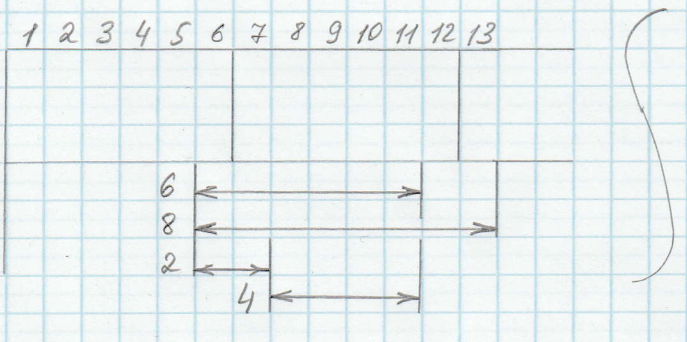
But $25-1=24/6=$ 4th six ($6\cdot4+1$), and $35+1=36/6=$ 6th six ($6\cdot6-1$), in this case behind there are unoccupied numbers $6n\pm1$, which will never be closed by 5.

Since the numbers $6n\pm1$ can intersect with others of the same type, it is necessary to take the nearest larger $6n\pm1$ to an already existing one, so as not to break the order. It is 7 ($6\cdot1+1$), which in turn through 4 steps closes $6n-1$, $7+4\cdot7=35$, occupied by the previous 5, after another 2 steps will close $6n+1$, $35+2\cdot7=49$, thereby again leaving unoccupied $6n\pm1$ numbers behind and so on.

Hence the product of the dynamic prime with the previous ones and their exponents are occupied $6n\pm1$ numbers. Then as the nearest larger $6n\pm1$ to the greatest prime is a new prime number.

In principle, 5 is enough to learn the following primes. It is clear that all the numbers $5n$ are in 5's row, then in it and all $5p$. Since 5 on 4 and 2 steps crosses $6n\pm1$ numbers, then in these intersections there will be numbers made from the following prime ones with 5 or 5 powers.

$5+4\cdot5=25/5=\underline{5}$, $+2\cdot5=35/5=7$, $+4\cdot5=55/5=11$, $+2\cdot5=65/5=13$, $+ \dots$



It is easy to see all possible distances between dynamic prime numbers, they are always a multiple of 2 or 6.

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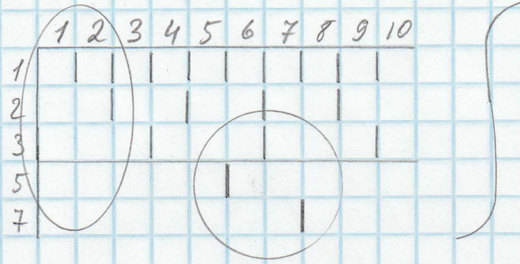
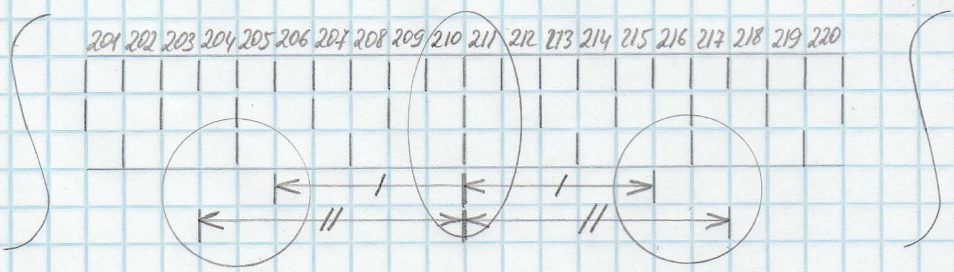
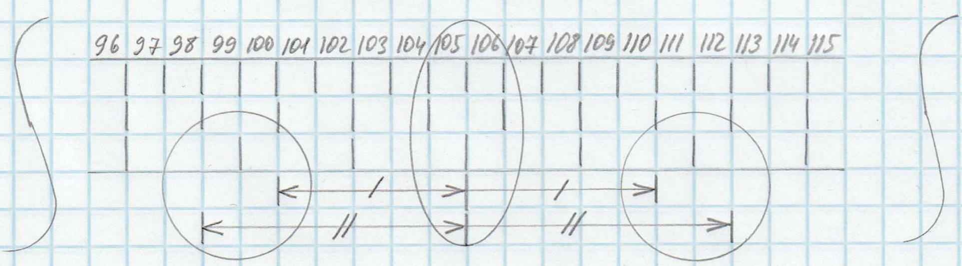


Consider the moment of appearance of 5 and 7, it is clear that the place $6 \times 0 + 1$ below the static numeric strip is free, since it is already occupied by 1. It is also seen that 5 and 7 start from one line, then probably further to the right there is exactly the same arrangement. Find it $5 \times 7 \times 6 = 210$.



We see that 210 is the initial line for $5 + 210$ and $7 + 210$, and $210 + 1$ is a new prime number because it is like $6 \times 0 + 1$ place, since $210 > 0$. Assume that it is occupied, then we take the product of all primes by 6, $p_1 \times p_2 \times p_3 \times \cdots \times p_n \cdot 6 = m$, then $m + 1$ will again be free, since all prime numbers will start from m, and $m > 0$, and if it is occupied, then not all prime numbers were taken and this is the most not taken into account number. Finding a new product $p_1 \times p_2 \times \cdots p_n \times p_{m+1} \cdot 6 = m_2$, then m_2 will move to the right, thereby creating the previous situation. Consequently, every following product of primes on 6 will create a new prime of the form $6n + 1$. So each new prime number will expand and deepen a kind of numerical funnel.

$$\cdots 6(6(6(6 \cdot 0 + 1) + 1) + 1) + 1 \cdots$$



We can also see that to the left of the 210 numbers move mirror in opposite directions and in the middle $210/2 = 105$, again converge and diverge. It is noteworthy that to the left of 0, negative numbers will also mirror to the other side.

It is interesting whether there exists such n for which numbers of the form $6n - 1$ cease to appear or they exist by the same rules, only move from infinity.

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