⇒ we get all values of $\bar{n}_1$ also by $\bar{n}_1'$ 1 but with different (y_1, Δ_1) pairs, if we want to fulfield the constraint $y_i \in \mathbb{N}$!

(I already showed (in other notes) tha this is fulfield. I will not repead it here, but you can also easy check this by yourself)

Assume we have given:

$$(*) \quad \boxed{\bar{n}_1 = (2x_1+1)y_1 - \Delta_1} \qquad \Delta_1 \in \{1, .., 2x_1\}$$

→ Have, for example, a look at: $(x_1 = 1)$:

$$\bar{n}_1 = 3y_1 - \Delta_1 \quad , \Delta_1 \in \{1, 2\}$$

$y_1 = 1$: $\bar{n}_1 = \begin{cases} \Delta_1 = 1: 2 \\ \Delta_1 = 2: 1 \end{cases}$

← We see: The number „3" is missing!

$y_1 = 2$: $\bar{n}_1 = \begin{cases} \Delta_1 = 1: 5 \\ \Delta_1 = 2: 4 \end{cases}$

$y_1 = 3$: $\bar{n}_1 = \begin{cases} \Delta_1 = 1: 8 \\ \Delta_1 = 2: 7 \end{cases}$

→ That's not what we want, since we want to find all prime numbers.

→ With this we will not get „3"

⋮

⇒ Our equation (*) is not usable (gives us not a valid range) for values ≤ 3.

→ But..., we already have to know „3" to generate this (*) equation, so the given number „3" comes from an earlier calculation step.

⇒ So it's just valid for $y_1 \geq 2$.!

Now let's switch to (only odd solutions)

$$(**) \quad \boxed{\bar{n}_1^o = (2x_1+1)(2u_1+1) - 2\Delta_1^o \quad , \Delta_1^o \in \{1, .., 2x_1\}}$$

$$u_1 \in \mathbb{N}$$