

Prime number formula  
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$$p \notin \left\{ \sum_{n=1}^a c + c \right\}$$

p is prime if and only if p not in the sequence/set.

where a is all natural numbers less than or equal to  $\left(\frac{p}{c}-1\right)$  ,  $a \in \mathbb{N}$

$$a = \{1, 2, \dots, \left(\frac{p}{c}-1\right)\}$$

and

where c is all the primes less than or equal to the squareroot of p,  $c \in \mathbb{N}$

$$c = \{2, 3, 5, \dots, c \leq \sqrt{p}\}$$

or if we want to use all natural numbers except 1 and not only pimes.

$$C = \{2, 3, 4, 5, 6, \dots, c \leq \sqrt{p}\}$$

example:

$$p=29$$

$$c \leq \sqrt{29} = 5, \{2, 3, 5\}$$

$$a \leq \frac{p}{c} - 1$$

$$c=2 \text{ so } \frac{29}{2} - 1 = 13 \text{ so } a = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13\}$$

$$\sum_{n=1}^a 2+2 = \text{set } a \text{ where } c \text{ is } 2 \{4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28\}$$

$$c=3 \text{ so } \frac{29}{3} - 1 = 8 \text{ so } a = \{1, 2, 3, 4, 5, 6, 7, 8\}$$

$$\sum_{n=1}^a 3+3 = \text{set } a \text{ where } c \text{ is } 3 \{6, 9, 15, 18, 21, 24, 27\}$$

$$c=5 \text{ so } \frac{29}{5} - 1 = 4 \text{ so } a = \{1, 2, 3, 4\}$$

$$\sum_{n=1}^a 5+5 = \text{set } a \text{ where } c \text{ is } 5 \{5, 10, 15, 20, 25\}$$

so p is prime because it's not in the set where c=2, c=3 and c=5