Technical Specification: Prime Constellations

1 Prime Constellations

Definition 1. *A* ***k*-tuple constellation** *is a sequence of primes* $(p, p + o_1, \ldots, p + o_k)$ *where the offsets* $\mathcal{O}$ *are minimal.*

Algorithm 1: Decidability for Prime Tuples

Input : Limit N, Offsets $\mathcal{O}$
Output: Base primes P

```
P ← ∅
for p ← 2 to N do
    isMatch ← true                          /* Check each offset */
    for s ∈ 𝒪 do
        if ¬isPrime(p + s) then
            isMatch ← false
            break
    if isMatch then
        P ← P ∪ {p}
```

Theorem 1. *The only prime triplet with offsets* $\{0, 2, 4\}$ *is* $\{3, 5, 7\}$.

Proof. Consider $p > 3$. The residues of $\{p, p + 2, p + 4\} \pmod 3$ will always contain a $0 \pmod 3$ regardless of whether $p \equiv 1$ or $p \equiv 2$. Since $p > 3$, this element is composite. Thus, no other cases exist. □

Base Prime (p)	Triplet Constellation	Verification Status
5	$\{5, 7, 11\}$	Verified ✓
11	$\{11, 13, 17\}$	Verified ✓
17	$\{17, 19, 23\}$	Verified ✓
41	$\{41, 43, 47\}$	Verified ✓

Generated for the 2026 Prime Sprint Recap.

"May your 2026 be as consistent as a Prime Triplet: Successive, Balanced, and Verified."