

Padrão prime sublists within lists (a definite prime pattern thorough a polynomial counting mod)

Seq1 is the list of the positions of the primes that share the same mod sequence and seq2 is the result of the $\text{Mod}\{1693,420\}+420n$ until 40. Now observe the result of FindInstance for seq1 and 2 and look that they are the same result ...

```
(* Defina as sequências *)
```

```
seq1 = {32, 164, 280, 488, 541, 640, 689, 738, 785, 976, 1020, 1113, 1159, 1208, 1253, 1297, 1383, 1564, 1689, 1738, 1829, 1873, 1953, 1995, 2084, 2162};
```

```
seq2 = {131, 551, 971, 1391, 1811, 2231, 2651, 3071, 3491, 3911, 4331, 4751, 5171, 5591, 6011, 6431, 6851, 7271, 7691, 8111, 8531, 8951, 9371, 9791, 10211, 10631}
```

```
(* Calcular Mod[X, 131] para cada sequência *)
```

```
modSeq1 = Mod[#, 131] & /@ seq1;
```

```
modSeq2 = Mod[#, 131] & /@ seq2;
```

```
(* Mostrar os resultados *)
```

```
{modSeq1, modSeq2}
```

```
b=seq2-seq1
```

```
Differences[b]
```

```
c=Mod[seq2,seq1]
```

```
d=Mod[b,seq1]
```

```
{131,551,971,1391,1811,2231,2651,3071,3491,3911,4331,4751,5171,5591,6011,6431,6851,7271,7691,8111,8531,8951,9371,9791,10211,10631}
```

```
{{32,33,18,95,17,116,34,83,130,59,103,65,111,29,74,118,73,123,117,35,126,39,119,30,119,66},  
{0,27,54,81,108,4,31,58,85,112,8,35,62,89,116,12,39,66,93,120,16,43,70,97,124,20}}
```

```
{99,387,691,903,1270,1591,1962,2333,2706,2935,3311,3638,4012,4383,4758,5134,5468,5707,  
,6002,6373,6702,7078,7418,7796,8127,8469}
```

```
{288,304,212,367,321,371,371,373,229,376,327,374,371,375,376,334,239,295,371,329,376,340,  
378,331,342}
```

```
{3,59,131,415,188,311,584,119,351,7,251,299,535,759,999,1243,1319,1015,935,1159,1215,1459,  
1559,1811,1875,1983}
```

```
{3,59,131,415,188,311,584,119,351,7,251,299,535,759,999,1243,1319,1015,935,1159,1215,1459,1559,1811,1875,1983}
```

```
(* Defina a sequência seq2 *)
```

```
seq2 = {131, 551, 971, 1391, 1811, 2231, 2651, 3071, 3491, 3911, 4331, 4751, 5171, 5591, 6011, 6431, 6851, 7271, 7691, 8111, 8531, 8951, 9371, 9791, 10211, 10631}
```

```
(* Defina seq1 como uma variável simbólica *)
```

```
Clear[x];
```

```
seq1 = Array[x, Length[seq2]];
```

```
(* Calcular a diferença entre seq2 e seq1 *)
```

```
b = seq2 - seq1;
```

```
(* Calcular Mod[seq2, seq1] *)
```

```
c = Mod[seq2, seq1];
```

```
(* Calcular Mod[b, seq1] *)
```

```
d = Mod[b, seq1];
```

```
(* Resolver a equação c == d para encontrar os valores de seq1 *)
```

```
sol = FindInstance[c == d, seq1];
```

```
(* Mostrar os resultados *)
```

```
Sol
```

```
{131,551,971,1391,1811,2231,2651,3071,3491,3911,4331,4751,5171,5591,6011,6431,6851,7271,7691,8111,8531,8951,9371,9791,10211,10631}
```

```
{x[1]->171/10-(103 I)/5,x[2]->64/5+I/10,x[3]->92/5+(89 I)/5,x[4]->69/5-I/5,x[5]->17/2+(23 I)/10,x[6]->-(181/10)+(114 I)/5,x[7]->7/2+(43 I)/5,x[8]->19/2-(63 I)/10,x[9]->-(157/10)+(207 I)/10,x[10]->16/5-(217 I)/10,x[11]->-(4/5)+(79 I)/5,x[12]->18/5+10 I,x[13]->-(35/2)-(23 I)/10,x[14]->213/10-(49 I)/5,x[15]->-(102/5)+(89 I)/10,x[16]->-(29/2)-(5 I)/2,x[17]->-(43/10)+(77 I)/5,x[18]->161/10-(41 I)/5,x[19]->-18+(39 I)/2,x[20]->-10+(79 I)/10,x[21]->58/5-
```

```
(23 I)/10,x[22]->-(17/5)-6 I,x[23]->-(83/5)-(74 I)/5,x[24]->-(8/5)+(7 I)/2,x[25]->39/10+(247 I)/10,x[26]->11/2+23 I}}
```

```
(* Defina a sequência seq2 *)
```

```
seq1 = {32, 164, 280, 488, 541, 640, 689, 738, 785, 976, 1020, 1113, 1159, 1208, 1253, 1297, 1383, 1564, 1689, 1738, 1829, 1873, 1953, 1995, 2084, 2162};
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```
(* Defina seq1 como uma variável simbólica *)
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Clear[x];
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seq1 = Array[x, Length[seq2]];
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(* Calcular a diferença entre seq2 e seq1 *)
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```
b = seq2 - seq1;
```

```
(* Calcular Mod[seq2, seq1] *)
```

```
c = Mod[seq2, seq1];
```

```
(* Calcular Mod[b, seq1] *)
```

```
d = Mod[b, seq1];
```

```
(* Resolver a equação c == d para encontrar os valores de seq1 *)
```

```
sol = FindInstance[c == d, seq1];
```

```
(* Mostrar os resultados *)
```

```
Sol
```

```
{{x[1]->171/10-(103 I)/5,x[2]->64/5+I/10,x[3]->92/5+(89 I)/5,x[4]->69/5-I/5,x[5]->17/2+(23 I)/10,x[6]->-(181/10)+(114 I)/5,x[7]->7/2+(43 I)/5,x[8]->19/2-(63 I)/10,x[9]->-(157/10)+(207 I)/10,x[10]->16/5-(217 I)/10,x[11]->-(4/5)+(79 I)/5,x[12]->18/5+10 I,x[13]->-(35/2)-(23 I)/10,x[14]->213/10-(49 I)/5,x[15]->-(102/5)+(89 I)/10,x[16]->-(29/2)-(5 I)/2,x[17]->-(43/10)+(77 I)/5,x[18]->161/10-(41 I)/5,x[19]->-18+(39 I)/2,x[20]->-10+(79 I)/10,x[21]->58/5-(23 I)/10,x[22]->-(17/5)-6 I,x[23]->-(83/5)-(74 I)/5,x[24]->-(8/5)+(7 I)/2,x[25]->39/10+(247 I)/10,x[26]->11/2+23 I}}
```