

> # Set the parameters and functions

c := 'c':

d := 'd':

u := 'u':

E2 := (18720000 c - 80917200) u⁷ + (247182000 c² + 158895891 - 31200000 d³ - 625467960 d) u⁶
+ (24960000 c⁵ + 837743400 c³ + 953375346 c - 182769600 d⁴ - 1720233045 d²) u⁵
+ (46430800 c⁶ + 1242271428 c⁴ + 2383438365 c² - 2080000 d⁷ - 398374080 d⁵
- 2200094964 d³) u⁴ + (28031640 c⁷ + 971831142 c⁵ + 3177917820 c³ - 311653419 d⁶
- 1326447576 d⁴) u³ + (310906194 c⁶ + 2383438365 c⁴ - 87069840 d⁷ - 431670600 d⁵) u²
+ (953375346 c⁵ - 27934920 d⁷ - 269600463 d⁶) u + 158895891 c⁶ - 139964760 d⁷:

print(Output);

find Sturm's sequence` `

for j from 0 by 1 to 499 do

c := $\frac{4005}{1000} + \frac{j+1}{500} \cdot \left(\frac{401}{100} - \frac{4005}{1000} \right)$:

d := $\frac{4005}{1000} + \frac{j}{500} \cdot \left(\frac{401}{100} - \frac{4005}{1000} \right)$:

u := 'u':

S := sturmseq(E2, u);

signnum := sturm(S, u, 4, $\frac{5292}{1000}$);

with(ArrayTools) :

Slength := Size(S, 2);

X := Array(1 .. Slength);

Y := Array(1 .. Slength);

for i from 1 to Slength do

Find sgn [s_{E_{2,i}}(4)]

u := 4;

X[i] := signum(S[i]);

Find sgn [s_{E_{2,i}}(5.292)]

u := $\frac{5292}{1000}$:

Y[i] := signum(S[i]);

end do;

show the final results

print(['a'[300 + j], 'a'[j + 301], sgn(s['E'[2, 300 + j]](4)), sgn(s['E'[2, 300 + j]](5.292))]
= [evalf(d, 5), evalf(c, 5), X, Y]);

end do:

Output

[a₃₀₀, a₃₀₁, sgn(s_{E_{2,300}}(4)), sgn(s_{E_{2,300}}(5.292))] = [4.0050, 4.0050, [-1 1 1 1 -1 -1 1 -1], [-1 1 1 1 -1 -1 1 -1]]
[a₃₀₁, a₃₀₂, sgn(s_{E_{2,301}}(4)), sgn(s_{E_{2,301}}(5.292))] = [4.0050, 4.0050, [-1 1 1 1 -1 -1 1 -1], [-1 1 1 1 -1 -1 1 -1]]
[a₃₀₂, a₃₀₃, sgn(s_{E_{2,302}}(4)), sgn(s_{E_{2,302}}(5.292))] = [4.0050, 4.0050, [-1 1 1 1 -1 -1 1 -1], [-1 1 1 1 -1 -1 1 -1]]
[a₃₀₃, a₃₀₄, sgn(s_{E_{2,303}}(4)), sgn(s_{E_{2,303}}(5.292))] = [4.0050, 4.0050, [-1 1 1 1 -1 -1 1 -1], [-1 1 1 1 -1 -1 1 -1]]
[a₃₀₄, a₃₀₅, sgn(s_{E_{2,304}}(4)), sgn(s_{E_{2,304}}(5.292))] = [4.0050, 4.0050, [-1 1 1 1 -1 -1 1 -1], [-1 1 1 1 -1 -1 1 -1]]

$$\begin{aligned}
& [a_{785}, a_{786}, \operatorname{sgn}(s_{E_{2,785}}(4)), \operatorname{sgn}(s_{E_{2,785}}(5.292))] = [4.0098, 4.0099, [-1 \ 1 \ 1 \ 1 \ -1 \ -1 \ 1 \ -1], [-1 \ 1 \ 1 \ 1 \ -1 \ -1 \ 1 \ -1]] \\
& [a_{786}, a_{787}, \operatorname{sgn}(s_{E_{2,786}}(4)), \operatorname{sgn}(s_{E_{2,786}}(5.292))] = [4.0099, 4.0099, [-1 \ 1 \ 1 \ 1 \ -1 \ -1 \ 1 \ -1], [-1 \ 1 \ 1 \ 1 \ -1 \ -1 \ 1 \ -1]] \\
& [a_{787}, a_{788}, \operatorname{sgn}(s_{E_{2,787}}(4)), \operatorname{sgn}(s_{E_{2,787}}(5.292))] = [4.0099, 4.0099, [-1 \ 1 \ 1 \ 1 \ -1 \ -1 \ 1 \ -1], [-1 \ 1 \ 1 \ 1 \ -1 \ -1 \ 1 \ -1]] \\
& [a_{788}, a_{789}, \operatorname{sgn}(s_{E_{2,788}}(4)), \operatorname{sgn}(s_{E_{2,788}}(5.292))] = [4.0099, 4.0099, [-1 \ 1 \ 1 \ 1 \ -1 \ -1 \ 1 \ -1], [-1 \ 1 \ 1 \ 1 \ -1 \ -1 \ 1 \ -1]] \\
& [a_{789}, a_{790}, \operatorname{sgn}(s_{E_{2,789}}(4)), \operatorname{sgn}(s_{E_{2,789}}(5.292))] = [4.0099, 4.0099, [-1 \ 1 \ 1 \ 1 \ -1 \ -1 \ 1 \ -1], [-1 \ 1 \ 1 \ 1 \ -1 \ -1 \ 1 \ -1]] \\
& [a_{790}, a_{791}, \operatorname{sgn}(s_{E_{2,790}}(4)), \operatorname{sgn}(s_{E_{2,790}}(5.292))] = [4.0099, 4.0099, [-1 \ 1 \ 1 \ 1 \ -1 \ -1 \ 1 \ -1], [-1 \ 1 \ 1 \ 1 \ -1 \ -1 \ 1 \ -1]] \\
& [a_{791}, a_{792}, \operatorname{sgn}(s_{E_{2,791}}(4)), \operatorname{sgn}(s_{E_{2,791}}(5.292))] = [4.0099, 4.0099, [-1 \ 1 \ 1 \ 1 \ -1 \ -1 \ 1 \ -1], [-1 \ 1 \ 1 \ 1 \ -1 \ -1 \ 1 \ -1]] \\
& [a_{792}, a_{793}, \operatorname{sgn}(s_{E_{2,792}}(4)), \operatorname{sgn}(s_{E_{2,792}}(5.292))] = [4.0099, 4.0099, [-1 \ 1 \ 1 \ 1 \ -1 \ -1 \ 1 \ -1], [-1 \ 1 \ 1 \ 1 \ -1 \ -1 \ 1 \ -1]] \\
& [a_{793}, a_{794}, \operatorname{sgn}(s_{E_{2,793}}(4)), \operatorname{sgn}(s_{E_{2,793}}(5.292))] = [4.0099, 4.0099, [-1 \ 1 \ 1 \ 1 \ -1 \ -1 \ 1 \ -1], [-1 \ 1 \ 1 \ 1 \ -1 \ -1 \ 1 \ -1]] \\
& [a_{794}, a_{795}, \operatorname{sgn}(s_{E_{2,794}}(4)), \operatorname{sgn}(s_{E_{2,794}}(5.292))] = [4.0099, 4.0100, [-1 \ 1 \ 1 \ 1 \ -1 \ -1 \ 1 \ -1], [-1 \ 1 \ 1 \ 1 \ -1 \ -1 \ 1 \ -1]] \\
& [a_{795}, a_{796}, \operatorname{sgn}(s_{E_{2,795}}(4)), \operatorname{sgn}(s_{E_{2,795}}(5.292))] = [4.0100, 4.0100, [-1 \ 1 \ 1 \ 1 \ -1 \ -1 \ 1 \ -1], [-1 \ 1 \ 1 \ 1 \ -1 \ -1 \ 1 \ -1]] \\
& [a_{796}, a_{797}, \operatorname{sgn}(s_{E_{2,796}}(4)), \operatorname{sgn}(s_{E_{2,796}}(5.292))] = [4.0100, 4.0100, [-1 \ 1 \ 1 \ 1 \ -1 \ -1 \ 1 \ -1], [-1 \ 1 \ 1 \ 1 \ -1 \ -1 \ 1 \ -1]] \\
& [a_{797}, a_{798}, \operatorname{sgn}(s_{E_{2,797}}(4)), \operatorname{sgn}(s_{E_{2,797}}(5.292))] = [4.0100, 4.0100, [-1 \ 1 \ 1 \ 1 \ -1 \ -1 \ 1 \ -1], [-1 \ 1 \ 1 \ 1 \ -1 \ -1 \ 1 \ -1]] \\
& [a_{798}, a_{799}, \operatorname{sgn}(s_{E_{2,798}}(4)), \operatorname{sgn}(s_{E_{2,798}}(5.292))] = [4.0100, 4.0100, [-1 \ 1 \ 1 \ 1 \ -1 \ -1 \ 1 \ -1], [-1 \ 1 \ 1 \ 1 \ -1 \ -1 \ 1 \ -1]] \\
& [a_{799}, a_{800}, \operatorname{sgn}(s_{E_{2,799}}(4)), \operatorname{sgn}(s_{E_{2,799}}(5.292))] = [4.0100, 4.0100, [-1 \ 1 \ 1 \ 1 \ -1 \ -1 \ 1 \ -1], [-1 \ 1 \ 1 \ 1 \ -1 \ -1 \ 1 \ -1]]
\end{aligned}$$

