

> # Set the parameters and functions

c := 'c':

d := 'd':

u := 'u':

$$E3 := (9360000 c - 40478400) u^7 + (123624000 c^2 + 79477167 - 15600000 d^3 - 312878520 d) u^6$$

$$+ (12480000 c^5 + 418993800 c^3 + 476863002 c - 91411200 d^4 - 860506665 d^2) u^5$$

$$+ (23217600 c^6 + 621308436 c^4 + 1192157505 c^2 - 1040000 d^7 - 199260960 d^5$$

$$- 1100550468 d^3) u^4 + (14018680 c^7 + 486042654 c^5 + 1589543340 c^3 - 155887303 d^6$$

$$- 663541512 d^4) u^3 + (155487978 c^6 + 1192157505 c^4 - 43552080 d^7 - 215944200 d^5) u^2$$

$$+ (476863002 c^5 - 13976040 d^7 - 134854731 d^6) u + 79477167 c^6 - 70008120 d^7 :$$

print(Output);

find Sturm's sequence` `

for j from 0 by 1 to 279 do

$$c := \frac{401}{100} + \frac{j+1}{280} \cdot \left(\frac{402}{100} - \frac{401}{100} \right) :$$

$$d := \frac{401}{100} + \frac{j}{280} \cdot \left(\frac{402}{100} - \frac{401}{100} \right) :$$

u := 'u':

S := sturmseq(E3, u);

$$\text{signnum} := \text{sturm}\left(S, u, 4, \frac{534}{100}\right);$$

with(ArrayTools) :

Slength := Size(S, 2);

X := Array(1 .. Slength);

Y := Array(1 .. Slength);

for i from 1 to Slength do

Find sgn $\left[s_{E_{3,i}}(4) \right]$

u := 4;

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

Find sgn $\left[s_{E_{3,i}}(5.34) \right]$

u := $\frac{534}{100}$;

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

end do;

show the final results

print(['a'[j], 'a'[j + 1], sgn(s['E'[3, j]](4)), sgn(s['E'[3, j]](5.34))] = [evalf(d, 5), evalf(c, 5), X,

Y]) ;

end do:

Output

$$\left[a_0, a_1, \text{sgn}\left(s_{E_{3,0}}(4)\right), \text{sgn}\left(s_{E_{3,0}}(5.34)\right) \right] = \left[4.0100, 4.0100, \left[-1 \ 1 \ 1 \ 1 \ -1 \ -1 \ 1 \ -1 \right], \left[-1 \ 1 \ 1 \ 1 \ -1 \ -1 \ 1 \ -1 \right] \right]$$

$$\left[a_1, a_2, \text{sgn}\left(s_{E_{3,1}}(4)\right), \text{sgn}\left(s_{E_{3,1}}(5.34)\right) \right] = \left[4.0100, 4.0101, \left[-1 \ 1 \ 1 \ 1 \ -1 \ -1 \ 1 \ -1 \right], \left[-1 \ 1 \ 1 \ 1 \ -1 \ -1 \ 1 \ -1 \right] \right]$$

$$\left[a_2, a_3, \text{sgn}\left(s_{E_{3,2}}(4)\right), \text{sgn}\left(s_{E_{3,2}}(5.34)\right) \right] = \left[4.0101, 4.0101, \left[-1 \ 1 \ 1 \ 1 \ -1 \ -1 \ 1 \ -1 \right], \left[-1 \ 1 \ 1 \ 1 \ -1 \ -1 \ 1 \ -1 \right] \right]$$

$$\left[a_3, a_4, \text{sgn}\left(s_{E_{3,3}}(4)\right), \text{sgn}\left(s_{E_{3,3}}(5.34)\right) \right] = \left[4.0101, 4.0101, \left[-1 \ 1 \ 1 \ 1 \ -1 \ -1 \ 1 \ -1 \right], \left[-1 \ 1 \ 1 \ 1 \ -1 \ -1 \ 1 \ -1 \right] \right]$$

