```
> # Set the parameters and functions
  a :='a':
  b :='b':
  u :='u':
   P := [4106/1000, 4125/1000, 414/100, 4153/1000, 4163/1000, 417/100]:
  K := (40 + 10 a) u^8 + (10 a^2 + 200 a - 10 b^3) u^7 + (5 a^5 + 280 a^2 - 10 b^3) u^6 + (
       -15 b^7 + 102 a^5 - 51 b^6 + 50 a^4 - 280 b^3) u^5 + (-1400 b^4 + 216 a^6 - 142 b^5
       + 9 a^8 + 56 a^7) u^4 + (-866 b^6 + 122 a^7 + 68 a^8 - 1960 b^5 - 9 b^9) u^3 + (
       -1166 b^7 - 56 b^8 + 15 a^10 + 11 a^9 - 1400 b^6) u^2 + (-520 b^7 - 602 b^8 - 54 b^9
       + 55 a^10) u - 80 b^8 - 100 b^9 :
  print(Output) :
  # Find Sturm's sequence
   with(ArrayTools) :
   for j from 1 by 1 to Size(P, 2) - 1 do
   a := P[j + 1];
   b := P[j];
   u :='u':
   S := sturmseq(K, u);
   with(ArrayTools) :
   Slength := Size(S, 2);
    X := Array(1 .. Slength);
   Y := Array(1 .. Slength);

     for i from 1 to Slength do
   # Find sign [s_'K[i]'(4.1)]
         u := 41/10;
         X[i] := signum(S[i]);
  # Find sign [s_'K[i]'(6)]
         u := 6 :
         Y[i] := signum(S[i]);
     end do;
  # show the final results
   print('a'[j - 1],'a'[j], sgn(s['K'[j - 1]](4.1)), sgn(s['K'[j - 1]](6)));
  print([evalf(b, 4), evalf(a, 4), X, Y]);
  end do:
```

Output

$$a_0,\ a_1,\ sgn\left(s_{K_0}(4.1)\right),\ sgn\left(s_{K_0}(6)\right)$$

$$\left[4.106,\ 4.125,\ \left[\begin{array}{cccccccccc} -1 & 1 & 1 & -1 & -1 & 1 & 1 & 1 & -1 \end{array}\right],\ \left[\begin{array}{cccccccccc} -1 & -1 & -1 & 1 & -1 & -1 & -1 & 1 & -1 \end{array}\right]\right]$$

$$a_1,\ a_2,\ sgn\left(s_{K_1}(4.1)\right),\ sgn\left(s_{K_1}(6)\right)$$

$$\left[4.125,\ 4.140,\ \left[\begin{array}{cccccccccc} -1 & 1 & 1 & -1 & -1 & 1 & 1 & 1 & -1 \end{array}\right],\ \left[\begin{array}{cccccccccc} -1 & -1 & -1 & 1 & -1 & -1 & 1 & 1 & -1 \end{array}\right]\right]$$

$$a_2,\ a_3,\ sgn\left(s_{K_2}(4.1)\right),\ sgn\left(s_{K_2}(6)\right)$$

$$\left[4.140,\ 4.153,\ \left[\begin{array}{cccccccccc} -1 & 1 & 1 & -1 & -1 & 1 & 1 & 1 & -1 \end{array}\right],\ \left[\begin{array}{cccccccccc} -1 & -1 & -1 & 1 & -1 & -1 & 1 & 1 & -1 \end{array}\right]\right]$$

$$a_3,\ a_4,\ sgn\left(s_{K_3}(4.1)\right),\ sgn\left(s_{K_3}(6)\right)$$

$$\left[4.153,\ 4.163,\ \left[\begin{array}{cccccccccc} -1 & 1 & 1 & -1 & -1 & 1 & 1 & 1 & -1 \end{array}\right],\ \left[\begin{array}{cccccccccc} -1 & -1 & 1 & 1 & -1 & -1 & 1 & 1 & -1 \end{array}\right]\right]$$

$$a_4,\ a_5,\ sgn\left(s_{K_4}(4.1)\right),\ sgn\left(s_{K_4}(6)\right)$$

$$\left[4.163,\ 4.170,\ \left[\begin{array}{cccccccccc} -1 & -1 & 1 & -1 & -1 & 1 & 1 & 1 & -1 \end{array}\right],\ \left[\begin{array}{cccccccccc} -1 & -1 & 1 & -1 & -1 & -1 & 1 & 1 & -1 \end{array}\right]\right] \quad \textbf{(1)}$$

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