Appendix to paper
Polynomial solutions of certain differential equations arising in physics

Example of a polynomial solution of degree 25 **of ODE (3.1)** of [1]

For the parameters $a = 1,\ b = -\frac{32}{5},\ c = 7,\ \delta = -1,\ f = -4,\ \epsilon = 12$ the polynomial solution of degree 25 of ODE (3.1) is found as

$$
\begin{aligned}
y(x) \;&= 26\,x^{25} - \frac{2275}{2}\,x^{24} + \frac{13552500}{563}\,x^{23} - \frac{49689688750}{151447}\,x^{22} + \frac{9310336750000}{2877493}\,x^{21} \\
&- \frac{4315444070437500}{175527073}\,x^{20} + \frac{12164339108796875000}{81269034799}\,x^{19} \\
&- \frac{234038421774523437500}{312244186333}\,x^{18} + \frac{57935165849791699218750}{18422406993647}\,x^{17} \\
&- \frac{400430097393796405761718 75}{3573946956767518}\,x^{16} + \frac{61164091865146080078125000}{1786973478383759}\,x^{15} \\
&- \frac{20975666429888216162109375 00}{23230655218988867}\,x^{14} + \frac{15029040968440148945312500000 00}{72711950835435153 71}\,x^{13} \\
&- \frac{29944702600482608649597167968 75}{72711950835435153 71}\,x^{12} \\
&+ \frac{13676746673170966590545654296875 00}{1912324306971944542573}\,x^{11} \\
&- \frac{20697034839127193401901245117187 50}{1912324306971944542573}\,x^{10} \\
&+ \frac{19340936939085550730628967285156 2500}{13577502579500806252268 3}\,x^{9} \\
&- \frac{13555630859061040371785831451416015625}{83449419700162647658172 09}\,x^{8} \\
&+ \frac{28206999301520979390652294158935546875000}{17682932034464465038766665871}\,x^{7} \\
&- \frac{34543524229321832978407468795776367187500}{25844285281140371979735896273}\,x^{6} \\
&+ \frac{35796378081371869408260389614105224609375000}{37965255077995206438232031625037}\,x^{5} \\
&- \frac{20833791842009163530317603170871734619140625}{37965255077995206438232031625037}\,x^{4} \\
&+ \frac{96851672298084062251786768436431884765625 00}{37965255077995206438232031625037}\,x^{3} \\
&- \frac{14780562323378909639580930143594741821289062 50}{16590816469083905213507397820141169}\,x^{2} \\
&- \frac{99711376152382155663038730621337890625000000 00}{21568061409809076777559617166183519 7} \\
&+ \frac{39884550460952862265215492248535156250000000 00}{21568061409809076777559617166183519 7}\,x
\end{aligned}
$$

References

[1] H. Azad, A. Laradji and M. T. Mustafa, Polynomial solutions of certain differential equations arising in physics (submitted)