Ghosh's partial differential equation and a parametric solution

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Abstract

In this paper, I describe my partial differential equation and a parametric solution.
The paper ends with "The End"

Introduction

My partial differential equation is

$$n^2 \left(\frac{\partial^2 z(x,y,t)}{\partial x^2} + 2\frac{\partial^2 z(x,y,t)}{\partial x\,\partial y} + \frac{\partial^2 z(x,y,t)}{\partial y^2} \right) + \frac{\partial z(x,y,t)}{\partial t} = 0$$

where $n > 0$ is a constant

A parametric solution

If

$$z(0,0,-1) = v_{oon}, \ z(0,1,-1) = v_{opn}, \ z(1,0,-1) = v_{pon}, \ z(1,1,-1) = v_{ppn},$$

$$z(0,0,0) = v_{ooo}, \ z(0,1,0) = v_{opo}, \ z(1,0,0) = v_{poo}, \ z(1,1,0) = v_{ppo},$$

$$z(0,0,1) = v_{oop}, \ z(0,1,1) = v_{opp}, \ z(1,0,1) = v_{pop}, \ z(1,1,1) = v_{ppp},$$

then for parameters

$$P_1, P_2, P_3, P_4, P_5, P_6, P_7, P_8, P_9,$$

a parametric solution to my partial differential equation is

$$\begin{aligned}
&3600n^4 z(x,y,t) = -21600t^2x^2P_6n^8 + 21600t^2y^2P_6n^8 + 21600t^2xP_6n^8 - 21600t^2yP_6n^8 + 720tx^4P_6n^6 - \\
&720ty^4P_6n^6 - 7200tx^3P_6n^6 + 7200ty^3P_6n^6 - 5760txy^3P_6n^6 + 6480txP_6n^6 + 5760tx^3yP_6n^6 - 6480tyP_6n^6 + \\
&3600t^2x^2P_7n^6 - 3600t^2y^2P_7n^6 - 3600t^2xP_7n^6 + 3600t^2yP_7n^6 - 10800t^2x^2P_8n^6 + 10800t^2y^2P_8n^6 + \\
&10800t^2xP_8n^6 - 10800t^2yP_8n^6 + 3600t^2x^2P_9n^6 - 3600t^2y^2P_9n^6 - 3600t^2xP_9n^6 + 3600t^2yP_9n^6 - \\
&1800t^2x^2v_{oon}n^6 + 1800t^2y^2v_{oon}n^6 + 1800t^2xv_{oon}n^6 - 1800t^2yv_{oon}n^6 + 1800t^2x^2v_{oop}n^6 - 1800t^2y^2v_{oop}n^6 - \\
&1800t^2xv_{oop}n^6 + 1800t^2yv_{oop}n^6 + 1800t^2x^2v_{opn}n^6 - 1800t^2y^2v_{opn}n^6 - 1800t^2xv_{opn}n^6 + 1800t^2yv_{opn}n^6 - \\
&1800t^2x^2v_{opp}n^6 + 1800t^2y^2v_{opp}n^6 + 1800t^2xv_{opp}n^6 - 1800t^2yv_{opp}n^6 + 1800t^2x^2v_{pon}n^6 - 1800t^2y^2v_{pon}n^6 - \\
&1800t^2xv_{pon}n^6 + 1800t^2yv_{pon}n^6 - 1800t^2x^2v_{pop}n^6 + 1800t^2y^2v_{pop}n^6 + 1800t^2xv_{pop}n^6 - 1800t^2yv_{pop}n^6 - \\
&1800t^2x^2v_{ppn}n^6 + 1800t^2y^2v_{ppn}n^6 + 1800t^2xv_{ppn}n^6 - 1800t^2yv_{ppn}n^6 + 1800t^2x^2v_{ppp}n^6 - 1800t^2y^2v_{ppp}n^6 - \\
&1800t^2xv_{ppp}n^6 + 1800t^2yv_{ppp}n^6 - 3600x^3P_1n^4 - 3600xy^2P_1n^4 + 3600y^2P_1n^4 + 3600xP_1n^4 + 7200x^2yP_1n^4 - \\
&3600xyP_1n^4 - 3600yP_1n^4 - 3600x^3P_2n^4 + 3600y^3P_2n^4 - 10800xy^2P_2n^4 + 3600xP_2n^4 + 10800x^2yP_2n^4 - \\
&3600yP_2n^4 + 1800x^4P_3n^4 - 1800y^4P_3n^4 + 3600xy^3P_3n^4 - 1800xP_3n^4 - 3600x^3yP_3n^4 + 1800yP_3n^4 - \\
&3600x^3P_4n^4 + 3600x^2P_4n^4 - 3600xy^2P_4n^4 + 7200x^2yP_4n^4 - 3600xyP_4n^4 + 1800x^4P_5n^4 - 600y^4P_5n^4 - \\
&1200x^3P_5n^4 + 3600x^2y^2P_5n^4 - 1200xy^2P_5n^4 - 600xP_5n^4 - 4800x^3yP_5n^4 + 2400x^2yP_5n^4 + 600yP_5n^4 + \\
&360x^2y^4P_6n^4 - 1800xy^4P_6n^4 + 3600x^2y^3P_6n^4 - 360x^4y^2P_6n^4 - 3600x^3y^2P_6n^4 + 3240xy^2P_6n^4 + \\
&1800x^4yP_6n^4 - 3240x^2yP_6n^4 - 120tx^4P_7n^4 + 120ty^4P_7n^4 - 1200tx^3P_7n^4 - 2400ty^3P_7n^4 + 960txy^3P_7n^4 + \\
&3600ty^2P_7n^4 + 1320txP_7n^4 - 960tx^3yP_7n^4 + 3600tx^2yP_7n^4 - 1320tyP_7n^4 - 3600txyP_7n^4 + 360tx^4P_8n^4 - \\
&360ty^4P_8n^4 - 2400tx^3P_8n^4 + 2400ty^3P_8n^4 - 2880txy^3P_8n^4 + 3600txy^2P_8n^4 + 2040txP_8n^4 + 2880tx^3yP_8n^4 - \\
&3600tx^2yP_8n^4 - 2040tyP_8n^4 - 120tx^4P_9n^4 + 120ty^4P_9n^4 - 1200tx^3P_9n^4 - 2400ty^3P_9n^4 + 960txy^3P_9n^4 + \\
&3600tx^2P_9n^4 - 2280txP_9n^4 - 960tx^3yP_9n^4 + 3600tx^2yP_9n^4 + 2280tyP_9n^4 - 3600txyP_9n^4 + 60tx^4v_{oon}n^4 -
\end{aligned}$$

$$60ty^4v_{oon}n^4 + 600tx^3v_{oon}n^4 + 1200ty^3v_{oon}n^4 - 480txy^3v_{oon}n^4 + 1800t^2v_{oon}n^4 + 1380t^2x^2v_{oon}n^4 -$$
$$3180t^2y^2v_{oon}n^4 - 1800tv_{oon}n^4 - 3180t^2xv_{oon}n^4 + 1140txv_{oon}n^4 + 480tx^3yv_{oon}n^4 + 1380t^2yv_{oon}n^4 -$$
$$1800tx^2yv_{oon}n^4 + 660tyv_{oon}n^4 + 1800t^2xyv_{oon}n^4 - 3600x^3v_{ooo}n^4 - 3600t^2v_{ooo}n^4 - 2760t^2x^2v_{ooo}n^4 +$$
$$6360t^2y^2v_{ooo}n^4 - 3600xy^2v_{ooo}n^4 + 6360t^2xv_{ooo}n^4 - 2760t^2yv_{ooo}n^4 + 7200x^2yv_{ooo}n^4 - 3600t^2xyv_{ooo}n^4 -$$
$$3600yv_{ooo}n^4 + 3600v_{ooo}n^4 - 60tx^4v_{oop}n^4 + 60ty^4v_{oop}n^4 - 600tx^3v_{oop}n^4 - 1200ty^3v_{oop}n^4 + 480txy^3v_{oop}n^4 +$$
$$1800t^2v_{oop}n^4 + 1380t^2x^2v_{oop}n^4 - 3180t^2y^2v_{oop}n^4 + 1800tv_{oop}n^4 - 3180t^2xv_{oop}n^4 - 1140txv_{oop}n^4 -$$
$$480tx^3yv_{oop}n^4 + 1380t^2yv_{oop}n^4 + 1800tx^2yv_{oop}n^4 - 660tyv_{oop}n^4 + 1800t^2xyv_{oop}n^4 - 60tx^4v_{opn}n^4 +$$
$$60ty^4v_{opn}n^4 - 600tx^3v_{opn}n^4 - 1200ty^3v_{opn}n^4 + 480txy^3v_{opn}n^4 - 300t^2x^2v_{opn}n^4 + 2100t^2y^2v_{opn}n^4 +$$
$$300t^2xv_{opn}n^4 + 660txv_{opn}n^4 - 480tx^3yv_{opn}n^4 - 300t^2yv_{opn}n^4 + 1800tx^2yv_{opn}n^4 - 660tyv_{opn}n^4 -$$
$$1800t^2xyv_{opn}n^4 + 3600x^3v_{opo}n^4 + 600t^2x^2v_{opo}n^4 - 4200t^2y^2v_{opo}n^4 + 3600xy^2v_{opo}n^4 - 600t^2xv_{opo}n^4 -$$
$$3600xv_{opo}n^4 + 600t^2yv_{opo}n^4 - 7200x^2yv_{opo}n^4 + 3600t^2xyv_{opo}n^4 + 3600yv_{opo}n^4 + 60tx^4v_{opp}n^4 -$$
$$60ty^4v_{opp}n^4 + 600tx^3v_{opp}n^4 + 1200ty^3v_{opp}n^4 - 480txy^3v_{opp}n^4 - 300t^2x^2v_{opp}n^4 + 2100t^2y^2v_{opp}n^4 +$$
$$300t^2xv_{opp}n^4 - 660txv_{opp}n^4 + 480tx^3yv_{opp}n^4 - 300t^2yv_{opp}n^4 - 1800tx^2yv_{opp}n^4 + 660tyv_{opp}n^4 -$$
$$1800t^2xyv_{opp}n^4 - 60tx^4v_{pon}n^4 + 60ty^4v_{pon}n^4 - 600tx^3v_{pon}n^4 - 1200ty^3v_{pon}n^4 + 480txy^3v_{pon}n^4 +$$
$$1500t^2x^2v_{pon}n^4 + 300t^2y^2v_{pon}n^4 + 300t^2xv_{pon}n^4 - 1140txv_{pon}n^4 - 480tx^3yv_{pon}n^4 - 300t^2yv_{pon}n^4 +$$
$$1800tx^2yv_{pon}n^4 + 1140tyv_{pon}n^4 - 1800t^2xyv_{pon}n^4 + 3600x^3v_{poo}n^4 - 3000t^2x^2v_{poo}n^4 - 600t^2y^2v_{poo}n^4 +$$
$$3600xy^2v_{poo}n^4 - 600t^2xv_{poo}n^4 + 600t^2yv_{poo}n^4 - 7200x^2yv_{poo}n^4 + 3600t^2xyv_{poo}n^4 + 60tx^4v_{pop}n^4 -$$
$$60ty^4v_{pop}n^4 + 600tx^3v_{pop}n^4 + 1200ty^3v_{pop}n^4 - 480txy^3v_{pop}n^4 + 1500t^2x^2v_{pop}n^4 + 300t^2y^2v_{pop}n^4 +$$
$$300t^2xv_{pop}n^4 + 1140txv_{pop}n^4 + 480tx^3yv_{pop}n^4 - 300t^2yv_{pop}n^4 - 1800tx^2yv_{pop}n^4 - 1140tyv_{pop}n^4 -$$
$$1800t^2xyv_{pop}n^4 + 60tx^4v_{ppn}n^4 - 60ty^4v_{ppn}n^4 + 600tx^3v_{ppn}n^4 + 1200ty^3v_{ppn}n^4 - 480txy^3v_{ppn}n^4 -$$
$$780t^2x^2v_{ppn}n^4 - 1020t^2y^2v_{ppn}n^4 + 780t^2xv_{ppn}n^4 - 660txv_{ppn}n^4 + 480tx^3yv_{ppn}n^4 + 1020t^2yv_{ppn}n^4 -$$
$$1800tx^2yv_{ppn}n^4 - 1140tyv_{ppn}n^4 + 1800t^2xyv_{ppn}n^4 - 3600x^3v_{ppo}n^4 + 1560t^2x^2v_{ppo}n^4 + 2040t^2y^2v_{ppo}n^4 -$$
$$3600xy^2v_{ppo}n^4 - 1560t^2xv_{ppo}n^4 + 3600xv_{ppo}n^4 - 2040t^2yv_{ppo}n^4 + 7200x^2yv_{ppo}n^4 - 3600t^2xyv_{ppo}n^4 -$$
$$60tx^4v_{ppp}n^4 + 60ty^4v_{ppp}n^4 - 600tx^3v_{ppp}n^4 - 1200ty^3v_{ppp}n^4 + 480txy^3v_{ppp}n^4 - 780t^2x^2v_{ppp}n^4 -$$
$$1020t^2y^2v_{ppp}n^4 + 780t^2xv_{ppp}n^4 + 660txv_{ppp}n^4 - 480tx^3yv_{ppp}n^4 + 1020t^2yv_{ppp}n^4 + 1800tx^2yv_{ppp}n^4 +$$
$$1140tyv_{ppp}n^4 + 1800t^2xyv_{ppp}n^4 - 300x^4P_7n^2 - 60x^2y^4P_7n^2 + 300xy^4P_7n^2 - 300y^4P_7n^2 + 600x^3P_7n^2 +$$
$$60x^4y^2P_7n^2 - 600x^3y^2P_7n^2 + 1260xy^2P_7n^2 - 300xP_7n^2 + 300x^4yP_7n^2 + 600x^3yP_7n^2 - 1860x^2yP_7n^2 +$$
$$300yP_7n^2 + 180x^2y^4P_8n^2 - 300xy^4P_8n^2 - 180x^4y^2P_8n^2 + 1020xy^2P_8n^2 + 300x^4P_8n^2 - 1020x^2yP_8n^2 -$$
$$600x^4P_9n^2 - 60x^2y^4P_9n^2 + 300xy^4P_9n^2 + 600x^3P_9n^2 + 60x^4y^2P_9n^2 - 600x^3y^2P_9n^2 - 540xy^2P_9n^2 +$$
$$300x^4yP_9n^2 + 600x^3yP_9n^2 - 60x^2yP_9n^2 + 74tx^4v_{oon}n^2 + 30x^2y^4v_{oon}n^2 + 226ty^4v_{oon}n^2 - 150xy^4v_{oon}n^2 -$$
$$340tx^3v_{oon}n^2 + 600x^3v_{oon}n^2 - 1160ty^3v_{oon}n^2 + 908txy^3v_{oon}n^2 - 30x^4y^2v_{oon}n^2 + 300x^3y^2v_{oon}n^2 -$$
$$900tx^2y^2v_{oon}n^2 + 570xy^2v_{oon}n^2 + 266txv_{oon}n^2 - 600xv_{oon}n^2 - 150x^4yv_{oon}n^2 - 308tx^3yv_{oon}n^2 +$$
$$2100tx^2yv_{oon}n^2 - 1470x^2yv_{oon}n^2 + 934tyv_{oon}n^2 - 1800txyv_{oon}n^2 + 900xyv_{oon}n^2 - 148tx^4v_{ooo}n^2 -$$
$$452ty^4v_{ooo}n^2 + 680tx^3v_{ooo}n^2 + 2320ty^3v_{ooo}n^2 - 1816txy^3v_{ooo}n^2 + 1800tx^2y^2v_{ooo}n^2 - 532txv_{ooo}n^2 +$$
$$616tx^3yv_{ooo}n^2 - 4200tx^2yv_{ooo}n^2 - 1868tyv_{ooo}n^2 + 3600txyv_{ooo}n^2 + 74tx^4v_{oop}n^2 - 30x^2y^4v_{oop}n^2 +$$
$$226ty^4v_{oop}n^2 + 150xy^4v_{oop}n^2 - 340tx^3v_{oop}n^2 - 600x^3v_{oop}n^2 - 1160ty^3v_{oop}n^2 + 908txy^3v_{oop}n^2 +$$
$$30x^4y^2v_{oop}n^2 - 300x^3y^2v_{oop}n^2 - 900tx^2y^2v_{oop}n^2 - 570xy^2v_{oop}n^2 + 266txv_{oop}n^2 + 600xv_{oop}n^2 +$$
$$150x^4yv_{oop}n^2 - 308tx^3yv_{oop}n^2 + 2100tx^2yv_{oop}n^2 + 1470x^2yv_{oop}n^2 + 934tyv_{oop}n^2 - 1800txyv_{oop}n^2 -$$
$$900xyv_{oop}n^2 - 110tx^4v_{opn}n^2 - 30x^2y^4v_{opn}n^2 - 190ty^4v_{opn}n^2 + 150xy^4v_{opn}n^2 + 100tx^3v_{opn}n^2 +$$
$$200ty^3v_{opn}n^2 - 620txy^3v_{opn}n^2 + 30x^4y^2v_{opn}n^2 - 300x^3y^2v_{opn}n^2 + 900tx^2y^2v_{opn}n^2 + 330xy^2v_{opn}n^2 +$$
$$10txv_{opn}n^2 + 150x^4yv_{opn}n^2 + 20tx^3yv_{opn}n^2 - 300tx^2yv_{opn}n^2 - 330x^2yv_{opn}n^2 - 10tyv_{opn}n^2 +$$
$$220tx^4v_{opo}n^2 + 380ty^4v_{opo}n^2 - 200tx^3v_{opo}n^2 - 400ty^3v_{opo}n^2 + 1240txy^3v_{opo}n^2 - 1800tx^2y^2v_{opo}n^2 -$$
$$20txv_{opo}n^2 - 40tx^3yv_{opo}n^2 + 600tx^2yv_{opo}n^2 + 20tyv_{opo}n^2 - 110tx^4v_{opp}n^2 + 30x^2y^4v_{opp}n^2 - 190ty^4v_{opp}n^2 -$$
$$150xy^4v_{opp}n^2 + 100tx^3v_{opp}n^2 + 200ty^3v_{opp}n^2 - 620txy^3v_{opp}n^2 - 30x^4y^2v_{opp}n^2 + 300x^3y^2v_{opp}n^2 +$$
$$900tx^2y^2v_{opp}n^2 - 330xy^2v_{opp}n^2 + 10txv_{opp}n^2 - 150x^4yv_{opp}n^2 + 20tx^3yv_{opp}n^2 - 300tx^2yv_{opp}n^2 +$$
$$330x^2yv_{opp}n^2 - 10tyv_{opp}n^2 - 170tx^4v_{pon}n^2 - 30x^2y^4v_{pon}n^2 - 130ty^4v_{pon}n^2 + 150xy^4v_{pon}n^2 +$$
$$100tx^3v_{pon}n^2 + 200ty^3v_{pon}n^2 - 140txy^3v_{pon}n^2 + 30x^4y^2v_{pon}n^2 - 300x^3y^2v_{pon}n^2 + 900tx^2y^2v_{pon}n^2 -$$
$$570xy^2v_{pon}n^2 + 70txv_{pon}n^2 + 150x^4yv_{pon}n^2 - 460tx^3yv_{pon}n^2 - 300tx^2yv_{pon}n^2 + 570x^2yv_{pon}n^2 -$$
$$70tyv_{pon}n^2 + 340tx^4v_{poo}n^2 + 260ty^4v_{poo}n^2 - 200tx^3v_{poo}n^2 - 400ty^3v_{poo}n^2 + 280txy^3v_{poo}n^2 -$$
$$1800tx^2y^2v_{poo}n^2 - 140txv_{poo}n^2 + 920tx^3yv_{poo}n^2 + 600tx^2yv_{poo}n^2 + 140tyv_{poo}n^2 - 170tx^4v_{pop}n^2 +$$
$$30x^2y^4v_{pop}n^2 - 130ty^4v_{pop}n^2 - 150xy^4v_{pop}n^2 + 100tx^3v_{pop}n^2 + 200ty^3v_{pop}n^2 - 140txy^3v_{pop}n^2 -$$
$$30x^4y^2v_{pop}n^2 + 300x^3y^2v_{pop}n^2 + 900tx^2y^2v_{pop}n^2 + 570xy^2v_{pop}n^2 + 70txv_{pop}n^2 - 150x^4yv_{pop}n^2 -$$
$$460tx^3yv_{pop}n^2 - 300tx^2yv_{pop}n^2 - 570x^2yv_{pop}n^2 - 70tyv_{pop}n^2 + 146tx^4v_{ppn}n^2 + 30x^2y^4v_{ppn}n^2 +$$
$$154ty^4v_{ppn}n^2 - 150xy^4v_{ppn}n^2 - 460tx^3v_{ppn}n^2 + 300x^3v_{ppn}n^2 - 440ty^3v_{ppn}n^2 + 332txy^3v_{ppn}n^2 -$$
$$30x^4y^2v_{ppn}n^2 + 300x^3y^2v_{ppn}n^2 - 900tx^2y^2v_{ppn}n^2 + 570xy^2v_{ppn}n^2 + 314txv_{ppn}n^2 - 300xv_{ppn}n^2 -$$
$$150x^4yv_{ppn}n^2 + 268tx^3yv_{ppn}n^2 + 300tx^2yv_{ppn}n^2 - 570x^2yv_{ppn}n^2 + 286tyv_{ppn}n^2 - 292tx^4v_{ppo}n^2 -$$
$$308ty^4v_{ppo}n^2 + 920tx^3v_{ppo}n^2 + 880ty^3v_{ppo}n^2 - 664txy^3v_{ppo}n^2 + 1800tx^2y^2v_{ppo}n^2 - 628txv_{ppo}n^2 -$$
$$536tx^3yv_{ppo}n^2 - 600tx^2yv_{ppo}n^2 - 572tyv_{ppo}n^2 + 146tx^4v_{ppp}n^2 - 30x^2y^4v_{ppp}n^2 + 154ty^4v_{ppp}n^2 +$$

$$150xy^4v_{ppp}n^2 - 460tx^3v_{ppp}n^2 - 300x^3v_{ppp}n^2 - 440ty^3v_{ppp}n^2 + 332txy^3v_{ppp}n^2 + 30x^4y^2v_{ppp}n^2 - 300x^3y^2v_{ppp}n^2 - 900tx^2y^2v_{ppp}n^2 - 570xy^2v_{ppp}n^2 + 314txv_{ppp}n^2 + 300xv_{ppp}n^2 + 150x^4yv_{ppp}n^2 + 268tx^3yv_{ppp}n^2 + 300tx^2yv_{ppp}n^2 + 570x^2yv_{ppp}n^2 + 286tyv_{ppp}n^2 - 150x^4v_{oon} - 113x^2y^4v_{oon} + 145xy^4v_{oon} + 70x^3v_{oon} + 150x^3y^3v_{oon} - 37x^4y^2v_{oon} - 290x^3y^2v_{oon} - 197xy^2v_{oon} + 80xv_{oon} + 115x^4yv_{oon} + 300x^3yv_{oon} - 73x^2yv_{oon} + 300x^4v_{ooo} + 226x^2y^4v_{ooo} - 290xy^4v_{ooo} - 140x^3v_{ooo} - 300x^3y^3v_{ooo} + 74x^4y^2v_{ooo} + 580x^3y^2v_{ooo} + 394xy^2v_{ooo} - 160xv_{ooo} - 230x^4yv_{ooo} - 600x^3yv_{ooo} + 146x^2yv_{ooo} - 150x^4v_{oop} - 113x^2y^4v_{oop} + 145xy^4v_{oop} + 70x^3v_{oop} + 150x^3y^3v_{oop} - 37x^4y^2v_{oop} - 290x^3y^2v_{oop} - 197xy^2v_{oop} + 80xv_{oop} + 115x^4yv_{oop} + 300x^3yv_{oop} - 73x^2yv_{oop} + 95x^2y^4v_{opn} - 25xy^4v_{opn} - 150x^3y^3v_{opn} + 55x^4y^2v_{opn} + 50x^3y^2v_{opn} + 5xy^2v_{opn} - 25x^4yv_{opn} - 5x^2yv_{opn} - 190x^2y^4v_{opo} + 50xy^4v_{opo} + 300x^3y^3v_{opo} - 110x^4y^2v_{opo} - 100x^3y^2v_{opo} - 10xy^2v_{opo} + 50x^4yv_{opo} + 10x^2yv_{opo} + 95x^2y^4v_{opp} - 25xy^4v_{opp} - 150x^3y^3v_{opp} + 55x^4y^2v_{opp} + 50x^3y^2v_{opp} + 5xy^2v_{opp} - 25x^4yv_{opp} - 5x^2yv_{opp} + 65x^2y^4v_{pon} - 25xy^4v_{pon} - 150x^3y^3v_{pon} + 85x^4y^2v_{pon} + 50x^3y^2v_{pon} + 35xy^2v_{pon} - 25x^4yv_{pon} - 35x^2yv_{pon} - 130x^2y^4v_{poo} + 50xy^4v_{poo} + 300x^3y^3v_{poo} - 170x^4y^2v_{poo} - 100x^3y^2v_{poo} - 70xy^2v_{poo} + 50x^4yv_{poo} + 70x^2yv_{poo} + 65x^2y^4v_{pop} - 25xy^4v_{pop} - 150x^3y^3v_{pop} + 85x^4y^2v_{pop} + 50x^3y^2v_{pop} + 35xy^2v_{pop} - 25x^4yv_{pop} - 35x^2yv_{pop} - 77x^2y^4v_{ppn} + 55xy^4v_{ppn} - 70x^3v_{ppn} + 150x^3y^3v_{ppn} - 73x^4y^2v_{ppn} - 110x^3y^2v_{ppn} - 113xy^2v_{ppn} + 70xv_{ppn} + 85x^4yv_{ppn} + 83x^2yv_{ppn} + 154x^2y^4v_{ppo} - 110xy^4v_{ppo} + 140x^3v_{ppo} - 300x^3y^3v_{ppo} + 146x^4y^2v_{ppo} + 220x^3y^2v_{ppo} + 226xy^2v_{ppo} - 140xv_{ppo} - 170x^4yv_{ppo} - 166x^2yv_{ppo} - 77x^2y^4v_{ppp} + 55xy^4v_{ppp} - 70x^3v_{ppp} + 150x^3y^3v_{ppp} - 73x^4y^2v_{ppp} - 110x^3y^2v_{ppp} - 113xy^2v_{ppp} + 70xv_{ppp} + 85x^4yv_{ppp} + 83x^2yv_{ppp}$$

The End