

APPENDIX

In Case V above, expressions corresponding to Q_j , $1 \leq j \leq 4$, in (3.12) for a general parameter value $c \in \mathbb{C} \setminus \{0, 1\}$, see the definition (3.6) of U , are needed. We offer these expressions as Mathematica printouts below. In these printouts, $t := w - c$, and qj stands for Q_j . Further, a, b, f and g stand for $\alpha, \beta, \gamma e^z$ and δe^{2z} , respectively.

Together [Expand[q1]]

$$-\frac{1}{t^4} (2 (2 c^2 - 8 c^3 + 12 c^4 - 8 c^5 + 2 c^6 + 3 c t - 14 c^2 t + 24 c^3 t - 18 c^4 t + 5 c^5 t + t^2 - 2 b t^2 - 7 c t^2 + 4 b c t^2 + 15 c^2 t^2 + 2 a c^2 t^2 - 2 b c^2 t^2 - 13 c^3 t^2 - 4 a c^3 t^2 + 4 c^4 t^2 + 2 a c^4 t^2 + 2 c f t^2 - 2 c^2 f t^2 - 2 c^2 g t^2 - t^3 + 2 b t^3 + 3 c t^3 + 2 a c t^3 - 2 b c t^3 - 3 c^2 t^3 - 6 a c^2 t^3 + c^3 t^3 + 4 a c^3 t^3 + f t^3 - 2 c f t^3 - 2 c g t^3 - 2 a c t^4 + 2 a c^2 t^4))$$

Together [Expand[q2]]

$$\frac{-2 c + 4 c^2 - 2 c^3 - t + 4 c t - 3 c^2 t + t^2 - c t^2}{t^2}$$

Together [Expand[q3]]

$$\frac{1}{t^8} (4 (4 c^4 - 32 c^5 + 112 c^6 - 224 c^7 + 280 c^8 - 224 c^9 + 112 c^{10} - 32 c^{11} + 4 c^{12} + 12 c^3 t - 104 c^4 t + 392 c^5 t - 840 c^6 t + 1120 c^7 t - 952 c^8 t + 504 c^9 t - 152 c^{10} t + 20 c^{11} t + 13 c^2 t^2 - 8 b c^2 t^2 - 128 c^3 t^2 + 48 b c^3 t^2 + 536 c^4 t^2 + 8 a c^4 t^2 - 120 b c^4 t^2 - 1256 c^5 t^2 - 48 a c^5 t^2 + 160 b c^5 t^2 + 1810 c^6 t^2 + 120 a c^6 t^2 - 120 b c^6 t^2 - 1648 c^7 t^2 - 160 a c^7 t^2 + 48 b c^7 t^2 + 928 c^8 t^2 + 120 a c^8 t^2 - 8 b c^8 t^2 - 296 c^9 t^2 - 48 a c^9 t^2 + 41 c^{10} t^2 + 8 a c^{10} t^2 + 8 c^3 f t^2 - 40 c^4 f t^2 + 80 c^5 f t^2 - 80 c^6 f t^2 + 40 c^7 f t^2 - 8 c^8 f t^2 - 8 c^4 g t^2 + 32 c^5 g t^2 - 48 c^6 g t^2 + 32 c^7 g t^2 - 8 c^8 g t^2 + 6 c t^3 - 8 b c t^3 - 74 c^2 t^3 + 64 b c^2 t^3 + 362 c^3 t^3 + 24 a c^3 t^3 - 200 b c^3 t^3 - 954 c^4 t^3 - 160 a c^4 t^3 + 320 b c^4 t^3 + 1510 c^5 t^3 + 440 a c^5 t^3 - 280 b c^5 t^3 - 1486 c^6 t^3 - 640 a c^6 t^3 + 128 b c^6 t^3 + 894 c^7 t^3 + 520 a c^7 t^3 - 24 b c^7 t^3 - 302 c^8 t^3 - 224 a c^8 t^3 + 44 c^9 t^3 + 40 a c^9 t^3 + 16 c^2 f t^3 - 88 c^3 f t^3 + 192 c^4 f t^3 - 208 c^5 f t^3 + 112 c^6 f t^3 - 24 c^7 f t^3 - 24 c^3 g t^3 + 96 c^4 g t^3 - 144 c^5 g t^3 + 96 c^6 g t^3 - 24 c^7 g t^3 + t^4 - 2 b t^4 - 20 c t^4 + 28 b c t^4 + 125 c^2 t^4 + 26 a c^2 t^4 - 118 b c^2 t^4 - 386 c^3 t^4 - 204 a c^3 t^4 + 232 b c^3 t^4 + 685 c^4 t^4 + 638 a c^4 t^4 - 238 b c^4 t^4 - 736 c^5 t^4 - 1032 a c^5 t^4 + 124 b c^5 t^4 + 475 c^6 t^4 + 918 a c^6 t^4 - 26 b c^6 t^4 - 170 c^7 t^4 - 428 a c^7 t^4 + 26 c^8 t^4 + 82 a c^8 t^4 + 10 c f t^4 - 66 c^2 f t^4 + 164 c^3 f t^4 - 196 c^4 f t^4 + 114 c^5 f t^4 - 26 c^6 f t^4 - 26 c^2 g t^4 + 104 c^3 g t^4 - 156 c^4 g t^4 + 104 c^5 g t^4 - 26 c^6 g t^4 - 2 t^5 + 4 b t^5 + 20 c t^5 + 12 a c t^5 - 28 b c t^5 - 78 c^2 t^5 - 124 a c^2 t^5 + 72 b c^2 t^5 + 160 c^3 t^5 + 464 a c^3 t^5 - 88 b c^3 t^5 - 190 c^4 t^5 - 856 a c^4 t^5 + 52 b c^4 t^5 + 132 c^5 t^5 + 844 a c^5 t^5 - 12 b c^5 t^5 - 50 c^6 t^5 - 428 a c^6 t^5 + 8 c^7 t^5 + 88 a c^7 t^5 + 2 f t^5 - 20 c f t^5 + 60 c^2 f t^5 - 80 c^3 f t^5 + 50 c^4 f t^5 - 12 c^5 f t^5 - 12 c g t^5 + 48 c^2 g t^5 - 72 c^3 g t^5 + 48 c^4 g t^5 - 12 c^5 g t^5 + t^6 + 2 a t^6 - 2 b t^6 - 6 c t^6 - 36 a c t^6 + 8 b c t^6 + 15 c^2 t^6 + 176 a c^2 t^6 - 12 b c^2 t^6 - 20 c^3 t^6 - 384 a c^3 t^6 + 8 b c^3 t^6 + 15 c^4 t^6 + 426 a c^4 t^6 - 2 b c^4 t^6 - 6 c^5 t^6 - 236 a c^5 t^6 + c^6 t^6 + 52 a c^6 t^6 - 2 f t^6 + 8 c f t^6 - 12 c^2 f t^6 + 8 c^3 f t^6 - 2 c^4 f t^6 - 2 g t^6 + 8 c g t^6 - 12 c^2 g t^6 + 8 c^3 g t^6 - 2 c^4 g t^6 - 4 a t^7 + 32 a c t^7 - 88 a c^2 t^7 + 112 a c^3 t^7 - 68 a c^4 t^7 + 16 a c^5 t^7 + 2 a t^8 - 8 a c t^8 + 12 a c^2 t^8 - 8 a c^3 t^8 + 2 a c^4 t^8))$$

Together [Expand[q4]]

$$\frac{1}{t^6} (4 (4 c^3 - 24 c^4 + 60 c^5 - 80 c^6 + 60 c^7 - 24 c^8 + 4 c^9 + 8 c^2 t - 56 c^3 t + 160 c^4 t - 240 c^5 t + 200 c^6 t - 88 c^7 t + 16 c^8 t + 5 c t^2 - 46 c^2 t^2 + 159 c^3 t^2 - 276 c^4 t^2 + 259 c^5 t^2 - 126 c^6 t^2 + 25 c^7 t^2 + t^3 - 16 c t^3 + 73 c^2 t^3 - 152 c^3 t^3 + 163 c^4 t^3 - 88 c^5 t^3 + 19 c^6 t^3 - 2 t^4 + 15 c t^4 - 40 c^2 t^4 + 50 c^3 t^4 - 30 c^4 t^4 + 7 c^5 t^4 + t^5 - 4 c t^5 + 6 c^2 t^5 - 4 c^3 t^5 + c^4 t^5))$$