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> restart;
> N := 10:
  F(Y) := add(p^i*f[i](Y), i = 0..N);
  HPMEq := (1 - p)*diff(F(Y), Y $ 4) + p*(diff(F(Y), Y $ 4) + R*
(diff(F(Y), Y $ 3)*F(Y)- diff(F(Y), Y $ 2)*diff(F(Y), Y $ 1))-G*
diff(F(Y), Y $ 2));
  sol:=[]:
  for i from 0 to N do
    sol:= [ sol[],
            dsolve
              ( [ eval
                  ( coeff(HPMEq, p, i) = 0,
                    sol
                  ),
                f[i](0) = -a,
                f[i](1) = -b,
                D(f[i])(0) = B * D(D(f[i]))(0),
                D(f[i])(1) = -B * D(D(f[i]))(1)
              ]
            )
          ];
  end do:
sol;

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$$F(Y) := f_0(Y) + p f_1(Y) + p^2 f_2(Y) + p^3 f_3(Y) + p^4 f_4(Y) + p^5 f_5(Y) + p^6 f_6(Y) + p^7 f_7(Y) \\ + p^8 f_8(Y) + p^9 f_9(Y) + p^{10} f_{10}(Y)$$

$$HPMEq := (1 - p) \left(\frac{d^4}{dY^4} f_0(Y) + p \left(\frac{d^4}{dY^4} f_1(Y) \right) + p^2 \left(\frac{d^4}{dY^4} f_2(Y) \right) + p^3 \left(\frac{d^4}{dY^4} f_3(Y) \right) + p^4 \left(\frac{d^4}{dY^4} f_4(Y) \right) + p^5 \left(\frac{d^4}{dY^4} f_5(Y) \right) + p^6 \left(\frac{d^4}{dY^4} f_6(Y) \right) + p^7 \left(\frac{d^4}{dY^4} f_7(Y) \right) + p^8 \left(\frac{d^4}{dY^4} f_8(Y) \right) + p^9 \left(\frac{d^4}{dY^4} f_9(Y) \right) + p^{10} \left(\frac{d^4}{dY^4} f_{10}(Y) \right) \right) + p \left(\frac{d^4}{dY^4} f_0(Y) + p \left(\frac{d^4}{dY^4} f_1(Y) \right) + p^2 \left(\frac{d^4}{dY^4} f_2(Y) \right) + p^3 \left(\frac{d^4}{dY^4} f_3(Y) \right) + p^4 \left(\frac{d^4}{dY^4} f_4(Y) \right) + p^5 \left(\frac{d^4}{dY^4} f_5(Y) \right) + p^6 \left(\frac{d^4}{dY^4} f_6(Y) \right) + p^7 \left(\frac{d^4}{dY^4} f_7(Y) \right) + p^8 \left(\frac{d^4}{dY^4} f_8(Y) \right) + p^9 \left(\frac{d^4}{dY^4} f_9(Y) \right) + p^{10} \left(\frac{d^4}{dY^4} f_{10}(Y) \right) + R \left(\left(\frac{d^3}{dY^3} f_0(Y) + p \left(\frac{d^3}{dY^3} f_1(Y) \right) + p^2 \left(\frac{d^3}{dY^3} f_2(Y) \right) + p^3 \left(\frac{d^3}{dY^3} f_3(Y) \right) + p^4 \left(\frac{d^3}{dY^3} f_4(Y) \right) + p^5 \left(\frac{d^3}{dY^3} f_5(Y) \right) + p^6 \left(\frac{d^3}{dY^3} f_6(Y) \right) + p^7 \left(\frac{d^3}{dY^3} f_7(Y) \right) + p^8 \left(\frac{d^3}{dY^3} f_8(Y) \right) + p^9 \left(\frac{d^3}{dY^3} f_9(Y) \right) + p^{10} \left(\frac{d^3}{dY^3} f_{10}(Y) \right) \right) \right) (f_0(Y) + p f_1(Y) + p^2 f_2(Y) + p^3 f_3(Y) + p^4 f_4(Y) + p^5 f_5(Y) + p^6 f_6(Y) + p^7 f_7(Y) + p^8 f_8(Y) + p^9 f_9(Y) + p^{10} f_{10}(Y))$$

$$\begin{aligned}
& + p^6 f_6(Y) + p^7 f_7(Y) + p^8 f_8(Y) + p^9 f_9(Y) + p^{10} f_{10}(Y) \Big) - \left(\frac{d^2}{dY^2} f_0(Y) + p \left(\frac{d^2}{dY^2} f_1(Y) \right) + p^2 \left(\frac{d^2}{dY^2} f_2(Y) \right) + p^3 \left(\frac{d^2}{dY^2} f_3(Y) \right) + p^4 \left(\frac{d^2}{dY^2} f_4(Y) \right) + p^5 \left(\frac{d^2}{dY^2} f_5(Y) \right) \right. \\
& + p^6 \left(\frac{d^2}{dY^2} f_6(Y) \right) + p^7 \left(\frac{d^2}{dY^2} f_7(Y) \right) + p^8 \left(\frac{d^2}{dY^2} f_8(Y) \right) + p^9 \left(\frac{d^2}{dY^2} f_9(Y) \right) \\
& + p^{10} \left(\frac{d^2}{dY^2} f_{10}(Y) \right) \Big) \left(\frac{d}{dY} f_0(Y) + p \left(\frac{d}{dY} f_1(Y) \right) + p^2 \left(\frac{d}{dY} f_2(Y) \right) + p^3 \left(\frac{d}{dY} f_3(Y) \right) + p^4 \left(\frac{d}{dY} f_4(Y) \right) + p^5 \left(\frac{d}{dY} f_5(Y) \right) + p^6 \left(\frac{d}{dY} f_6(Y) \right) + p^7 \left(\frac{d}{dY} f_7(Y) \right) \right. \\
& + p^8 \left(\frac{d}{dY} f_8(Y) \right) + p^9 \left(\frac{d}{dY} f_9(Y) \right) + p^{10} \left(\frac{d}{dY} f_{10}(Y) \right) \Big) \Big) - G \left(\frac{d^2}{dY^2} f_0(Y) \right. \\
& + p \left(\frac{d^2}{dY^2} f_1(Y) \right) + p^2 \left(\frac{d^2}{dY^2} f_2(Y) \right) + p^3 \left(\frac{d^2}{dY^2} f_3(Y) \right) + p^4 \left(\frac{d^2}{dY^2} f_4(Y) \right) \\
& + p^5 \left(\frac{d^2}{dY^2} f_5(Y) \right) + p^6 \left(\frac{d^2}{dY^2} f_6(Y) \right) + p^7 \left(\frac{d^2}{dY^2} f_7(Y) \right) + p^8 \left(\frac{d^2}{dY^2} f_8(Y) \right) \\
& + p^9 \left(\frac{d^2}{dY^2} f_9(Y) \right) + p^{10} \left(\frac{d^2}{dY^2} f_{10}(Y) \right) \Big) \Big) \\
& \left[f_0(Y) = -\frac{2(a-b)Y^3}{6B+1} + \frac{3(a-b)Y^2}{6B+1} + \frac{6B(a-b)Y}{6B+1} - a, f_1(Y) = \right. \\
& - \frac{1}{(6B+1)^2} \left(6(a-b) \left(-\frac{1}{105} RY^7 a + \frac{1}{105} RY^7 b + \frac{1}{30} RY^6 a - \frac{1}{30} RY^6 b \right. \right. \\
& + \frac{1}{10} BG Y^5 + \frac{1}{4} BR a Y^4 + \frac{1}{4} BR b Y^4 - \frac{1}{20} RY^5 a + \frac{1}{20} RY^5 b - \frac{1}{4} BG Y^4 \\
& + \frac{1}{60} Y^5 G + \frac{1}{12} RY^4 a - \frac{1}{24} Y^4 G \Big) \Big) - \frac{1}{70(36B^2+12B+1)(6B+1)} \Big((\\
& -1260B^2Ra^2 + 1260B^2Rb^2 + 420B^2Ga - 420B^2Gb - 462BRa^2 + 84RaBb \\
& + 378BRb^2 + 5040B^2a - 5040B^2b + 154BGa - 154GBb - 43Ra^2 + 16RaBb \\
& + 27Rb^2 + 1680Ba - 1680Bb + 14Ga - 14Gb + 140a - 140b) Y^3 \Big) \\
& + \frac{1}{140(432B^4+432B^3+144B^2+20B+1)} \Big((-1260B^2Ra^2 + 1260B^2Rb^2 \\
& + 30240B^3a - 30240B^3b + 84B^2Ga - 84B^2Gb - 426BRa^2 + 12RaBb
\end{aligned} \tag{1}$$

$$\begin{aligned}
& + 414 B R b^2 + 25200 B^2 a - 25200 B^2 b + 56 B G a - 56 B G b - 38 R a^2 + 6 R a b \\
& + 32 R b^2 + 5880 B a - 5880 B b + 7 G a - 7 G b + 420 a - 420 b) Y^2) \\
& + \frac{1}{70 (432 B^4 + 432 B^3 + 144 B^2 + 20 B + 1)} (B (-1260 B^2 R a^2 + 1260 B^2 R b^2 \\
& + 30240 B^3 a - 30240 B^3 b + 84 B^2 G a - 84 B^2 G b - 426 B R a^2 + 12 R a B b \\
& + 414 B R b^2 + 25200 B^2 a - 25200 B^2 b + 56 B G a - 56 B G b - 38 R a^2 + 6 R a b \\
& + 32 R b^2 + 5880 B a - 5880 B b + 7 G a - 7 G b + 420 a - 420 b) Y) - a]
\end{aligned}$$