Writing out expansions around p, we have

$$F'(z)^2 = \frac{1}{z^6} + \frac{c}{z^2} + [-1]$$

and $$F(z)^3 = \frac{1}{z^6} + \frac{c'}{z^3} + \frac{c''}{z^2} + [-1],$$

so that the meromorphic function

$$F'(z)^2 + c' F'(z) - F(z)^3 + (c'' - c) F(z)$$

is holomorphic away from p, with at most a single pole at p, hence equal to a constant.

$|\Gamma$ $$F'(z) = \frac{1}{z^3} + [1] = \frac{1}{z^3} + a_1 z + a_2 z^2 + \cdots$$

$$F'(z)^2 = \frac{1}{z^6} + \frac{2a_1}{z^2} + \frac{2a_2}{z} + \cdots$$

$$= \frac{1}{z^6} + \frac{2a_1}{z^2} + \frac{1}{z}(2a_2 + \cdots)$$

$$= \frac{1}{z^6} + \frac{c}{z^2} + [-1].$$

$$F(z) = \frac{1}{z^2} + [1] = \frac{1}{z^2} + b_1 z + b_2 z^2 + \cdots$$

$$= \frac{1}{z^2} + z\, g(z)$$

$$F(z)^3 = \left(\frac{1}{z^2} + z\, g(z)\right)^3 = \frac{1}{z^6} + 3\frac{g(z)}{z^3} + 3 g(z) +$$

$$z^3 g^3(z) = \frac{1}{z^6} + \frac{c'}{z^3} + \frac{c''}{z^2} + \frac{1}{z}(c_0 + c_1 z + \cdots)$$

$$= \frac{1}{z^6} + \frac{c'}{z^3} + \frac{c''}{z^2} + [-1].$$

$$\Rightarrow F'(z)^2 + c' F'(z) - F(z)^3 + (c'' - c) F(z) =$$