Target equation:

$$-ia_1u^{(1,0)}(x,t)+a_{10}u^{(10,0)}(x,t)+a_2u^{(2,0)}(x,t)-ia_3u^{(3,0)}(x,t)+a_4u^{(4,0)}(x,t)-ia_5u^{(5,0)}(x,t)+$$
$$a_6u^{(6,0)}(x,t)-ia_7u^{(7,0)}(x,t)+a_8u^{(8,0)}(x,t)-ia_9u^{(9,0)}(x,t)-bu(x,t)\left|u(x,t)\right|^2+iu^{(0,1)}(x,t)=0$$

Substitutions:

$$\mathrm{N}=5$$
$$u(x,t)\to y(z)e^{i(kx-\omega t)}$$
$$z\to x-\mathrm{C0}t$$
$$y(z)\to AR(z)^5$$
$$R'(z)^2=R(z)^2\left(1-\chi R(z)^2\right)$$

Imaginary part of equation after substitutions:

$$y'(z)\left(a_1-10a_{10}k^9-2a_2k-3a_3k^2+4a_4k^3+5a_5k^4-6a_6k^5-7a_7k^6+8a_8k^7+9a_9k^8-\mathrm{C0}\right)+y^{(3)}(z)\left(120a_1\right.$$
$$252a_{10}k^5y^{(5)}(z)+120a_{10}k^3y^{(7)}(z)-10a_{10}ky^{(9)}(z)+a_5y^{(5)}(z)-6a_6ky^{(5)}(z)-21a_7k^2y^{(5)}(z)+$$
$$a_7y^{(7)}(z)+56a_8k^3y^{(5)}(z)-8a_8ky^{(7)}(z)+126a_9k^4y^{(5)}(z)-36a_9k^2y^{(7)}(z)+a_9y^{(9)}(z)=0$$

Real part of equation after substitutions:

$$y(z)\left(a_1k-a_{10}k^{10}-a_2k^2-a_3k^3+a_4k^4+a_5k^5-a_6k^6-a_7k^7+a_8k^8+a_9k^9+\omega\right)+y''(z)\left(45a_{10}k^8+a_2+3a\right.$$
$$210a_{10}k^6y^{(4)}(z)+210a_{10}k^4y^{(6)}(z)-45a_{10}k^2y^{(8)}(z)+a_{10}y^{(10)}(z)+a_4y^{(4)}(z)+5a_5ky^{(4)}(z)-15a_6k^2y^{(4)}(z)+$$
$$a_6y^{(6)}(z)-35a_7k^3y^{(4)}(z)+7a_7ky^{(6)}(z)+70a_8k^4y^{(4)}(z)-28a_8k^2y^{(6)}(z)+a_8y^{(8)}(z)+126a_9k^5y^{(4)}(z)-$$
$$84a_9k^3y^{(6)}(z)+9a_9ky^{(8)}(z)-by(z)^3=0$$

Constraints on coefficients from imaginary part of equation:

$$a_9\to 10a_{10}k$$
$$a_7\to 8\left(30a_{10}k^3+a_8k\right)$$
$$a_5\to 2\left(2016a_{10}k^5+3a_6k+56a_8k^3\right)$$
$$a_3\to 4\left(8160a_{10}k^7+a_4k+10a_6k^3+224a_8k^5\right)$$
$$\mathrm{C0}\to a_1-79360a_{10}k^9-2a_2k-8a_4k^3-96a_6k^5-2176a_8k^7$$

Constraints on coefficients from real part of equation:

$$b\to -\frac{3632428800a_{10}\chi^5}{A^2}$$
$$a_8\to -5a_{10}\left(9k^2+89\right)$$
$$a_6\to 14\left(15a_{10}k^4+890a_{10}k^2+5187a_{10}\right)$$
$$a_4\to -10\left(21a_{10}k^6+3115a_{10}k^4+108927a_{10}k^2+536233a_{10}\right)$$
$$a_2\to 45a_{10}k^8+12460a_{10}k^6+1089270a_{10}k^4+32173980a_{10}k^2+176396581a_{10}$$
$$\omega\to -a_1k+9a_{10}k^{10}+3115a_{10}k^8+363090a_{10}k^6+16086990a_{10}k^4+176396581a_{10}k^2-2029052025a_{10}$$

y(z) - function:

$$\frac{1024a^5A}{\left(4a^2e^z+\chi e^{-z}\right)^5}$$

u(x, t) - function:

$$\frac{1024a^5 Ae^{i(kx-\omega t)}}{\left(4a^2 e^{\mathrm{C0}t+x} + \chi e^{-\mathrm{C0}t-x}\right)^5}$$