PARTIAL LIST ↔ Analytical Solutions.

	$K^2(x)$	Solutions of $y''(x) + K^2(x)\, y(x) = 0$
1.	a^2	$e^{\pm iax}$
2.	α / x^2	x^β, $\beta = \frac{1}{2}\left(1 \pm \sqrt{1 - 4\alpha}\right)$
3.	$ax + b$	$Ai(\xi)$ and $Bi(\xi)$; $\xi = -\frac{ax+b}{a^{2/3}}$.
4.	$(ax+b)^m$	$(ax+b)^{1/2} J_\mu(\xi)$ and $(ax+b)^{1/2} Y_\mu(\xi)$, $\mu = \frac{1}{m+2}$, $\xi = \frac{2(ax+b)^{\frac{m}{2}+1}}{(m+2)a}$.
5.	$\frac{ax^m + b}{x^2}$	$x^{1/2} J_\mu(\xi)$ and $x^{1/2} Y_\mu(\xi)$, $\xi = \frac{2\sqrt{a}}{m} x^{m/2}$, $\mu = \frac{(1-4b)^{1/2}}{m}$.
6.	$ae^x - b$	$J_\mu(\xi)$ and $Y_\mu(\xi)$; $\xi = 2\sqrt{a}\, e^{x/2}$; $\mu = 2\sqrt{b}$
7.	$\frac{K}{(x-a)^2(x-b)^2}$	$(x-a)^{\frac{1+\mu}{2}}(x-b)^{\frac{1-\mu}{2}}$ and $(x-a)^{\frac{1-\mu}{2}}(x-b)^{\frac{1+\mu}{2}}$; $\mu^2 = 1 + \frac{4K}{(a-b)^2}$
8.	$-\frac{a^2}{4} + \frac{ak}{x} + \frac{1/4 - m^2}{x^2}$	$\xi^{\pm m + \frac{1}{2}} e^{-\xi/2} {}_1F_1\left(\frac{1}{2} \pm m - k, \pm 2m + 1, \xi\right)$, $\xi = ax$: Confluent Hypergeometric functions.
9.	$-\frac{\phi''(x)}{\phi(x)}$	$\phi(x)$
10.	$-[\phi(x)]^2 \pm \phi'(x)$	$\exp\left[\mp \int_0^x \phi(t)\, dt\right]$
11.	$\frac{n(n+1)}{1-x^2} + \frac{1-m^2}{(1-x^2)^2}$	$(1-x^2)^{1/2} P_n^m(x)$ or $(1-x^2)^{1/2} Q_n^m(x)$ Legendre functions.

$J_n(\xi) \rightarrow$ Bessel's fuction 1st Kind

$Y_n(\xi) \rightarrow$ Bessel's function 2nd Kind

$Ai(x)$ and $Bi(x)$ are Airy functions.