OSCILLATING SOLUTIONS OF THE EQUATION $y'' + a(x)y = 0$ WITH DISCONTINOUS COEFFICIENT a(x)

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We have shown that two linearly independent, particularly oscillating solutions for the equation of linear oscillations $y'' + a(x) \cdot y = 0$ *can be determined by iteration sequence method for each positive and negative coefficient a(x). These solutions are actually general (generalized) sine and cosine with the base a(x), i.e.* $y_1 = \sin_{a(x)} x$ *and* $y_2 = \cos_{a(x)} x$. *However, oscillations break can occur if break of characteristics and changes occur. It can also happen if sign changes and in case of coefficient a(x) break which is the initiator of oscillations. Actually, we have taken these cases in consideration in our work, because we have not found anything similar in the literature.*

Canonical equation $y'' + a(x) \cdot y = 0$ on the semi axis $[0,+\infty)$ has oscillating solutions if *a(x)>0* and the integral $\int_0^{+\infty} a(x)dx$ diverges, which is in compliance with the physical meaning of the coefficient *a(x)* which represent difference of forces which cause oscillations and resistance. Oscillations break occur if coefficient *a(x)* changes sign or has definite or infinite oscillatority breaks. Oscillatority is tested only if coefficient *a(x)* between breaks is positive function.

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