

Classification of Sturm-Liouville Problems at Infinity

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Abstract : We determine the values of k and p such that the Sturm-Liouville differential operator $\tau u = -(d^2 u)/(dx^2) + kx^p u$ is in limit point case or limit circle case at infinity. In particular it is shown that τ is in the limit point case when (i) for $p=2$ and $\forall k$, (ii) for $\forall p$ and $k=0$, (iii) for all p and $k>0$, (iv) for $0 \leq p \leq 2$ and $k<0$, (v) for $p<0$ and $k<0$. τ is in the limit circle case when (i) for $p>2$ and $k<0$.

Keywords : limit point case, limit circle case, Sturm-Liouville, infinity

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