1010-40-6 **Maher M Marzuq***, PO Box 7207 Hawally, 32093 Hawally, Kuwait. *Integrability Theorems of Trigonometric Series.* Preliminary report.

Let $f(x)$ be associated with the following cosine series

$$\frac{1}{2}a_0 + \sum_{n=1}^{\infty} a_b \cos nx \tag{1}$$

where a_n is monotically decreasing to zero. In this paper I prove the following result:

Let $\psi(x) \sim < -1, 0 >$ and $\{a_n\}$ be a δ-quasi-monotone. If the series

$$\sum_{n=1}^{\infty} \delta_n \psi(\frac{1}{n}) \tag{2}$$

and

$$\sum_{n=1}^{\infty} \frac{1}{n}\psi(\frac{1}{n})a_n \tag{3}$$

converge, then the series (1) converges everywhere to $f(x)$ with possible exception at $x = 0$ and

$$\psi(x)f(x) \in L[0, \pi]. \tag{4}$$

Conversely, if $\{a_n\}$ is any sequence which is ultimately positive numbers for which cosine series (1) converges to $f(x)$ everywhere with the possible exception at $x = 0$ and if (4) holds, then (3) is true.

Corollaries are drawn from this theorem. (Received April 07, 2005)