Standard Limit Formulas

$$\lim_{x \longrightarrow 0} \frac{\sin x}{x} = \lim_{x \longrightarrow 0} \frac{\tan x}{x} = 1$$

$$\lim_{x \longrightarrow 0} \frac{\tan^{-1} x}{x} = \lim_{x \longrightarrow 0} \frac{\sin^{-1} x}{x} = 1$$

$$\lim_{x \longrightarrow 0} (1 + x)^{1/x} = e$$

$$\lim_{x \longrightarrow 0} (1 + ax)^{1/x} = e^a$$

$$\lim_{x \longrightarrow \infty} (1 + 1/x)^{x} = e$$

$$\lim_{x \longrightarrow \infty} (1 + a/x)^{x} = e^a$$

$$\lim_{x \longrightarrow 0} \frac{e^x - 1}{x} = 1$$

$$\lim_{x \longrightarrow 0} \frac{a^x - 1}{x} = \ln a \ \ ; a > 0$$

$$\lim_{x \longrightarrow 0} \frac{\ln (1 + x)}{x} = 1$$

$$\lim_{x \longrightarrow 0} \frac{x^n - a^n}{x - a} = na^{n-1}$$

If $f(x) \longrightarrow 0$ *when* $x \longrightarrow a$ *then :*

$$\lim_{x \longrightarrow a} \frac{\sin f(x)}{f(x)} = 1$$

$$\lim_{x \longrightarrow a} \frac{\tan f(x)}{f(x)} = 1$$

$$\lim_{x \longrightarrow a} \cos f(x) = 1$$

$$\lim_{x \longrightarrow a} \frac{e^{f(x)} - 1}{f(x)} = 1$$

$$\lim_{x \longrightarrow a} \cos f(x) = 1$$

$$\lim_{x \longrightarrow a} \frac{e^{f(x)} - 1}{f(x)} = 1$$