

به نام خدا  
 فرمولهای مهم سینوس و کسینوس

$$\textcircled{1} \sin(\alpha \oplus \beta) = \sin \alpha \cos \beta \oplus \cos \alpha \sin \beta$$

$$\textcircled{2} \cos(\alpha \oplus \beta) = \cos \alpha \cos \beta \ominus \sin \alpha \sin \beta$$

$$\textcircled{3} \tan(\alpha \oplus \beta) = \frac{\tan \alpha \oplus \tan \beta}{1 \ominus \tan \alpha \tan \beta}$$

$$\textcircled{4} \begin{cases} \sin^2 \alpha = r \sin \alpha \cos \alpha \\ \sin \alpha \cos \alpha = \frac{1}{r} \sin^2 \alpha \end{cases}$$

$$\textcircled{5} \begin{cases} \cos^2 \alpha = \cos^2 \alpha - \sin^2 \alpha \\ \cos^2 \alpha = r \cos^2 \alpha - 1 \\ \cos^2 \alpha = 1 - r \sin^2 \alpha \end{cases}$$

$$\textcircled{6} \begin{cases} 1 + \cos^2 \alpha = r \cos^2 \alpha \\ 1 - \cos^2 \alpha = r \sin^2 \alpha \end{cases}$$

$$\textcircled{7} \begin{cases} \sin^2 \alpha = \frac{1 - \cos^2 \alpha}{r} \\ \cos^2 \alpha = \frac{1 + \cos^2 \alpha}{r} \\ \tan^2 \alpha = \frac{1 - \cos^2 \alpha}{1 + \cos^2 \alpha} \end{cases}$$

$$\textcircled{8} \begin{cases} \tan^2 \alpha = \frac{r \tan \alpha}{1 - \tan^2 \alpha} \\ \sin^2 \alpha = \frac{r \tan \alpha}{1 + \tan^2 \alpha} \\ \cos^2 \alpha = \frac{1 - \tan^2 \alpha}{1 + \tan^2 \alpha} \end{cases}$$

$$\textcircled{9} \begin{cases} \cot x - \tan x = r \cot^2 x \\ \tan x + \cot x = \frac{r}{\sin^2 x} \end{cases}$$

$$\textcircled{10} \begin{cases} \frac{\sin^2 \alpha}{1 + \cos^2 \alpha} = \tan \alpha \\ \frac{\sin^2 \alpha}{1 - \cos^2 \alpha} = \cot \alpha \end{cases}$$

$$\textcircled{11} \begin{cases} \sin^3 x = r \sin x - r^2 \sin^2 x \\ \cos^3 x = r \cos^2 x - r \cos x \\ \tan^3 x = \frac{r^2 \tan x - \tan^3 x}{1 - r^2 \tan^2 x} \end{cases}$$

$$\textcircled{12} \begin{cases} \sin x \oplus \cos x = \sqrt{r} \sin(x \oplus \frac{\pi}{r}) \\ r \sin x + \cos x = \sqrt{r} \cos(x - \frac{\pi}{r}) \\ \sin x - \cos x = -\sqrt{r} \cos(x + \frac{\pi}{r}) \end{cases}$$

$$\textcircled{13} (\sin x \oplus \cos x)^2 = 1 \oplus r \sin x \cos x = 1 \oplus \sin^2 x$$