

## Тригонометрия

1) $\cos^2 \alpha + \sin^2 \alpha = 1$	14) $\sin \alpha \pm \sin \beta = 2 \cdot \sin \frac{\alpha \pm \beta}{2} \cdot \cos \frac{\alpha \mp \beta}{2}$
2) $\cos 2\alpha = \cos^2 \alpha - \sin^2 \alpha =$ $\cos 2\alpha = 1 - 2 \sin^2 \alpha = 2 \cos^2 \alpha - 1$	15) $\cos \alpha + \cos \beta = 2 \cdot \cos \frac{\alpha + \beta}{2} \cdot \cos \frac{\alpha - \beta}{2}$
3) $\sin 2\alpha = 2 \sin \alpha \cdot \cos \alpha$ 4) $\operatorname{tg} 2\alpha = \frac{2 \operatorname{tg} \alpha}{1 - \operatorname{tg}^2 \alpha}$	16) $\cos \alpha - \cos \beta = -2 \cdot \sin \frac{\alpha + \beta}{2} \cdot \sin \frac{\alpha - \beta}{2}$
5) $\sin 3\alpha = 3 \sin \alpha - 4 \sin^3 \alpha$	17) $\sin \alpha \cdot \cos \beta = \frac{\sin(\alpha + \beta) + \sin(\alpha - \beta)}{2}$
6) $\cos 3\alpha = 4 \cos^3 \alpha - 3 \cos \alpha$	18) $\sin \alpha \cdot \sin \beta = \frac{\cos(\alpha - \beta) - \cos(\alpha + \beta)}{2}$
7) $\operatorname{tg} \alpha = \frac{\sin \alpha}{\cos \alpha}$ ... 8) $\operatorname{tg} 3\alpha = \frac{3 \operatorname{tg} \alpha - \operatorname{tg}^3 \alpha}{1 - 3 \operatorname{tg}^2 \alpha}$	19) $\cos \alpha \cdot \cos \beta = \frac{\cos(\alpha + \beta) + \cos(\alpha - \beta)}{2}$
7) $\sin^2 \frac{\alpha}{2} = \frac{1 - \cos \alpha}{2}$ ... 8) $\cos^2 \frac{\alpha}{2} = \frac{1 + \cos \alpha}{2}$	20) $\cos \alpha = \frac{1 - \operatorname{tg}^2 \frac{\alpha}{2}}{1 + \operatorname{tg}^2 \frac{\alpha}{2}}$ ... 21) $\sin \alpha = \frac{2 \cdot \operatorname{tg} \frac{\alpha}{2}}{1 + \operatorname{tg}^2 \frac{\alpha}{2}}$
10) $1 + \operatorname{tg}^2 \alpha = \frac{1}{\cos^2 \alpha}$ ... 1) $1 + \operatorname{ctg}^2 \alpha = \frac{1}{\sin^2 \alpha}$	22) $\operatorname{tg} \alpha = \frac{2 \cdot \operatorname{tg} \frac{\alpha}{2}}{1 - \operatorname{tg}^2 \frac{\alpha}{2}}$
11) $\sin(\alpha \pm \beta) = \sin \alpha \cdot \cos \beta \pm \cos \alpha \cdot \sin \beta$	23) $a \sin \alpha + b \cos \alpha = \sqrt{a^2 + b^2} \cdot \sin(\alpha + \phi)$
12) $\cos(\alpha \pm \beta) = \cos \alpha \cdot \cos \beta \mp \sin \alpha \cdot \sin \beta$	$\sin \alpha = \frac{b}{\sqrt{a^2 + b^2}} \dots \cos \alpha = \frac{a}{\sqrt{a^2 + b^2}} \dots \alpha \in [0, 2\pi)$
13) $\operatorname{tg}(\alpha \pm \beta) = \frac{\operatorname{tg} \alpha \pm \operatorname{tg} \beta}{1 \mp \operatorname{tg} \alpha \cdot \operatorname{tg} \beta}$	

