



AGZAMXODJAEVA M.SH

Mavzu:

Asosiy trigonometrik ayniyatlar



6- Dars Mavzu: Qo`shish formulalari



TIAME

TEOREMA:

Ixtiyoriy α va β uchun quyidagi tengliklar o`rinli:

$$\cos(\alpha + \beta) = \cos\alpha\cos\beta - \sin\alpha\sin\beta \quad (1)$$

$$\cos(\alpha - \beta) = \cos\alpha\cos\beta + \sin\alpha\sin\beta \quad (2)$$

$$\sin(\alpha + \beta) = \sin\alpha\cos\beta + \cos\alpha\sin\beta \quad (3)$$

$$\sin(\alpha - \beta) = \sin\alpha\cos\beta - \cos\alpha\sin\beta \quad (4)$$

$$\operatorname{tg}(\alpha + \beta) = \frac{\operatorname{tg}\alpha \pm \operatorname{tg}\beta}{1 \pm \operatorname{tg}\alpha \operatorname{tg}\beta} \quad (5)$$

$M_0(1:0)$ nuqtani koordinatalar boshi atrofida $\alpha, -\beta, \alpha + \beta$ radian burchaklarga burishda $M_\alpha, M_{-\beta}$ va $M_{\alpha+\beta}$ nuqtalar hosil bo`ladi. Sinus va kosinusning ta`rifiga ko`ra

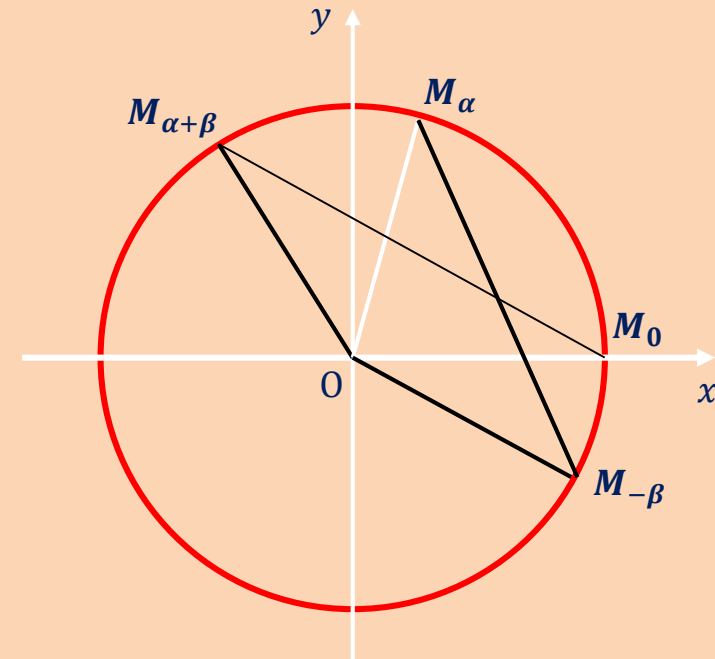
$$M_\alpha(\cos\alpha; \sin\alpha), M_{-\beta}(\cos(-\beta)); \sin(-\beta)),$$

$$M_{\alpha+\beta}(\cos(\alpha + \beta); \sin(\alpha + \beta))$$

$\angle M_\alpha OM_{\alpha+\beta} < M_{-\beta} OM_\alpha$ 2ta teng yonli uchburchak bo`ladi.

$$(M_0M_{\alpha+\beta})^2 = (M_\alpha M_{\alpha+\beta})^2$$

$(1 - \cos(\alpha + \beta))^2 + (\sin(\alpha + \beta))^2 = (\cos(-\beta) - \cos\alpha)^2 + (\sin(-\beta) - \sin\alpha)^2$ buni soddalashtirsak (1) formula kelib chiqadi. (1) formulada β ni $-\beta$ ga almashtirilsa (2) chiqadi.





$$1. \text{ Misol. } \cos 75^\circ = \cos(45+30) = \cos 45 \cos 30 - \sin 45 \sin 30 = \frac{\sqrt{2}}{2} \frac{\sqrt{3}}{2} - \frac{\sqrt{2}}{2} \frac{1}{2} = \frac{\sqrt{6-\sqrt{2}}}{4}$$

$$2. \text{ Misol. } \sin 210^\circ = \sin(180^\circ + 30^\circ) = \sin 180^\circ \cos 30^\circ + \cos 180^\circ \sin 30^\circ = \\ = 0 \frac{\sqrt{3}}{2} + (-1) \frac{1}{2} = -\frac{1}{2}$$

$$3. \text{ Misol. } \operatorname{tg} 225^\circ = \operatorname{tg}(180^\circ + 45^\circ) = \frac{\operatorname{tg} 180^\circ + \operatorname{tg} 45^\circ}{1 - \operatorname{tg} 180^\circ \operatorname{tg} 45^\circ} = 1$$