

$$1^\circ. \quad \frac{\sin 3\alpha + \sin \alpha}{\cos 3\alpha - \cos \alpha} + \operatorname{ctg} \alpha = \frac{2 \sin \frac{3\alpha+\alpha}{2} \cos \frac{3\alpha-\alpha}{2}}{-2 \sin \frac{3\alpha+\alpha}{2} \sin \frac{3\alpha-\alpha}{2}} + \operatorname{ctg} \alpha = -\frac{\cos \alpha}{\sin \alpha} + \operatorname{ctg} \alpha = 0$$

$$2^\circ. \quad \frac{\sin 3\alpha - \sin \alpha}{\cos 3\alpha + \cos \alpha} - \operatorname{tg} \alpha = \frac{2 \cos \frac{3\alpha+\alpha}{2} \sin \frac{3\alpha-\alpha}{2}}{2 \cos \frac{3\alpha+\alpha}{2} \cos \frac{3\alpha-\alpha}{2}} - \operatorname{tg} \alpha = \frac{\sin \alpha}{\cos \alpha} - \operatorname{tg} \alpha = 0.$$

(Neumann Frida, Budapest.)