Zadatak 10. Dokaži:

1) $\dfrac{\sin 3x + \sin 5x}{\cos 3x + \cos 5x} = \operatorname{tg} 4x$;

2) $\dfrac{\cos x - \cos 3x}{\sin x - \sin 3x} = -\operatorname{tg} 2x$.

Rješenje. **1)**

$$\frac{\sin 3x + \sin 5x}{\cos 3x + \cos 5x} = \operatorname{tg} 4x$$

$$\frac{2 \sin \dfrac{3x + 5x}{2} \cos \dfrac{3x - 5x}{2}}{2 \cos \dfrac{3x + 5x}{2} \cos \dfrac{3x - 5x}{2}} = \operatorname{tg} 4x$$

$$\frac{\sin 4x}{\cos 4x} = \operatorname{tg} 4x$$

$$\operatorname{tg} 4x = \operatorname{tg} 4x$$

2)

$$\frac{\cos x - \cos 3x}{\sin x - \sin 3x} = -\operatorname{tg} 2x$$

$$\frac{-2 \sin \dfrac{x + 3x}{2} \sin \dfrac{x - 3x}{2}}{2 \cos x + 3x 2 \sin \dfrac{x - 3x}{2}} = -\operatorname{tg} 2x$$

$$-\frac{\sin 2x}{\cos 2x} = -\operatorname{tg} 2x$$

$$-\operatorname{tg} 2x = -\operatorname{tg} 2x$$