

Continuació de l'exercici (19)

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$$\begin{aligned}\cos 15^\circ &= \cos (45^\circ - 30^\circ) = \cos 45^\circ \cos 30^\circ + \sin 45^\circ \sin 30^\circ = \\ &= \frac{\sqrt{2}}{2} \frac{\sqrt{3}}{2} + \frac{\sqrt{2}}{2} \frac{1}{2} = \frac{\sqrt{2}}{4} (\sqrt{3} + 1) = \\ &= \frac{\sqrt{3} + 1}{2\sqrt{2}} \approx 0.97\end{aligned}$$

(21) a) $\frac{\sin 2x}{1 + \cos 2x} = \frac{2 \sin x \cos x}{1 + \cos^2 x - \sin^2 x} = \frac{2 \sin x \cos x}{\cos^2 x + \cos^2 x} =$

fórmules del sin i cos de l'angle doble

$$\sin^2 x + \cos^2 x = 1$$
$$1 - \sin^2 x = \cos^2 x$$

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

b) $\frac{\sin 2x}{1 - \cos^2 x} \cdot \frac{\sin 2x}{\cos x} = \frac{(2 \sin x \cos x)^2}{\sin^2 x \cos x} =$

$$1 - \cos^2 x = \sin^2 x$$

$$= \frac{4 \sin^2 x \cos^2 x}{\sin^2 x \cos x} = 4 \cos x$$

c) $\frac{\sin 3a - \sin 5a}{\cos 3a + \cos 5a} = \frac{2 \cos \left(\frac{3a+5a}{2}\right) \cdot \sin \left(\frac{3a-5a}{2}\right)}{2 \cos \left(\frac{3a+5a}{2}\right) \cdot \cos \left(\frac{3a-5a}{2}\right)} =$

fórmules de suma i diferència de sinus i cosinus

$$= \frac{\sin \left(\frac{-2a}{2}\right)}{\cos \left(\frac{-2a}{2}\right)} = \frac{\sin(-a)}{\cos(-a)} = \frac{-\sin a}{\cos a} = \boxed{-\operatorname{tg} a}$$