# Más ejercicios- Repartido nº1

$(A+B)(A-B)=A^2-B^2$

**2) c)** $\dfrac{2\cos^2\alpha-1}{1+\operatorname{Tg}\alpha}=(1-\operatorname{Tg}\alpha)\cos^2\alpha$

$$2\cos^2\alpha-1=(1-\operatorname{Tg}^2\alpha)\cos^2\alpha$$

$$2\cos^2\alpha-1=\left(\frac{1}{1}-\frac{\operatorname{sen}^2\alpha}{\cos^2\alpha}\right)\cdot\cos^2\alpha$$

$$2\cos^2\alpha-1=\frac{\cos^2\alpha-\operatorname{sen}^2\alpha}{\cancel{\cos^2\alpha}}\cdot\cancel{\cos^2\alpha}$$

$$2\cos^2\alpha-1=\cos^2\alpha-\operatorname{sen}^2\alpha$$

$$\underbrace{2\cos^2\alpha-\cos^2\alpha}+\operatorname{sen}^2\alpha=1$$

$$\boxed{\cos^2\alpha+\operatorname{sen}^2\alpha=1}$$

$$1=1$$

**3) b** $-2(\operatorname{sen}x+\cos x)$ a) $\operatorname{sen}2x$

**4) b)** $\operatorname{sen}\left(3x-\dfrac{\pi}{30}\right)=\operatorname{sen}\left(x+\dfrac{\pi}{9}\right)$

$$3x-\frac{\pi}{30}=x+\frac{\pi}{9}+2K\pi \rightarrow 2x=\frac{\pi}{30}+\frac{\pi}{9}+2K\pi$$

$$x=\frac{\pi}{60}+\frac{\pi}{18}+K\pi$$

$$x=\frac{18\pi+60\pi}{1080}+K\pi$$

$$x=\frac{78\pi}{1080}+K\pi$$

$$\boxed{x=\frac{13}{180}\pi+K\pi}$$

$$3x-\frac{\pi}{30}=\pi-\left(x+\frac{\pi}{9}\right)+2K\pi$$

$$3x-\frac{\pi}{30}=\pi-x-\frac{\pi}{9}+2K\pi$$

$$4x=\frac{\pi}{1}-\frac{\pi}{9}+\frac{\pi}{30}+2K\pi$$

$$4x=\frac{90\pi-10\pi+3\pi}{90}+2K\pi$$

$$4x=\frac{83\pi}{90}+2K\pi \longrightarrow \boxed{x=\frac{83}{360}\pi+\frac{K\pi}{2}}$$

4) c) $11\cos^2 x - 5\,\text{sen}^2 x + 1 = 0$

$$11(1-\text{sen}^2 x) - 5\,\text{sen}^2 x + 1 = 0.$$

ej: $\underbrace{7\cos^2 x}$ $+ \underline{5}\,\text{sen}^2 x + 1 = 0$

$$\underline{2}\cos^2 x + \underbrace{\underline{5}\cos^2 x + 5\,\text{sen}^2 x}_{5(\underbrace{\cos^2 x + \text{sen}^2 x}_{1})} + 1 = 0$$

$$2\cos^2 x + 5 + 1 = 0$$

$$\text{sen}^2 x = \frac{3}{4}$$

$$\text{sen}\, x = +\sqrt{\frac{3}{4}} \Rightarrow \text{sen}\, x = \frac{\sqrt{3}}{2}$$

$$\text{sen}\, x = -\sqrt{\frac{3}{4}} \Rightarrow \text{sen}\, x = \frac{-\sqrt{3}}{2}$$

4) d) $\left(3\cdot\sqrt{1-\cos x}\right)^2 = \left(\sqrt{3}\cdot\cos x\right)^2$

$$9\cdot(1-\cos x) = 3\cdot\cos^2 x$$

$$9 - 9\cos x = 3\cos^2 x$$

$$-3\cos^2 x - 9\cos x + 9 = 0$$

$\boxed{\cos x = z}$ $\quad -3z^2 - 9z + 9 = 0$

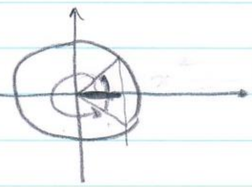
$$-z^2 - 3z + 3 = 0 \qquad z = \frac{-3\pm\sqrt{21}}{2}$$

$\cos x = \frac{-3+\sqrt{21}}{2}$ $\qquad$ $\cos x = \cancel{\frac{-3-\sqrt{21}}{2}} < -1$

$$x = \cos^{-1}\left(\frac{-3+\sqrt{21}}{2}\right)$$

$x \cong 37°41' + 2K\pi \quad , K\in\mathbb{Z}$

$x \cong 322°19' + 2K\pi \quad , K\in\mathbb{Z}$



$180° \;—\; \pi$

$37°41' \;—\; x \cong 0{,}66$

$322°19' \;—\; x \cong 5{,}62$

Sol $= \begin{cases} 0{,}66 + 2K\pi \\ 5{,}62 + 2K\pi \end{cases}$

Verificar en la original $\quad 3\sqrt{1-\cos x} = \sqrt{3}\cdot\cos x$

$$3\sqrt{1-\cos(0{,}66+2K\pi)} = \sqrt{3}\cdot\cos(0{,}66+2K\pi)$$

$$3\cdot\sqrt{1-\left(\frac{-3+\sqrt{21}}{2}\right)} = \sqrt{3}\cdot\cos\left(\frac{-3+\sqrt{21}}{2}\right)$$

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$\operatorname{sen} 2x = z$

$e \cong 2{,}71 \qquad 2^{x^2+x} \qquad e^{x^2+X}$

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$(A+B)(A-B) = A^2 - B^2$

$(A+B)^2 = A^2+2AB+B^2$

Verificación:

$$3\cdot\sqrt{1-\cos x} = \sqrt{3}\cdot\cos x.$$

$$3\cdot\sqrt{1-\left(\frac{-3+\sqrt{21}}{2}\right)} = \sqrt{3}\cdot\left(\frac{-3+\sqrt{21}}{2}\right)$$

$$3\cdot\sqrt{\frac{5-\sqrt{21}}{2}} = \sqrt{3}\cdot\left(\frac{-3+\sqrt{21}}{2}\right)$$

$$\frac{\sqrt{\frac{5-\sqrt{21}}{2}}}{\sqrt{3}} = \frac{\frac{-3+\sqrt{21}}{2}}{3}$$

Como ambos son positivos si elevo al cuadrado no pasa nada, la ecuación es equivalente a la anterior.

$$\overset{>0}{\sqrt{\frac{5-\sqrt{21}}{6}}} = \overset{>0}{\frac{-3+\sqrt{21}}{6}}$$

$$\frac{5-\sqrt{21}}{6} = \frac{9+21-6\sqrt{21}}{36}$$

Desarrollé el binomio al cuadrado.

$$\frac{30-6\sqrt{21}}{36} = \frac{30-6\sqrt{21}}{36} \checkmark$$

Por lo tanto ambas soluciones son solución del ejercicio dado.