Prof. Fisher Suxe.

Arcos Compuestos

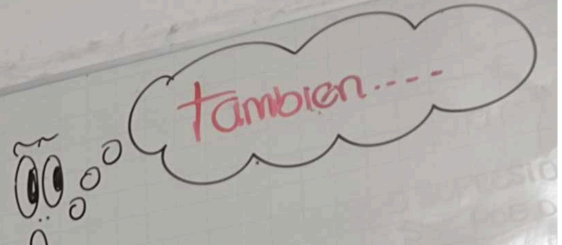
(A) Identidades fundamentales

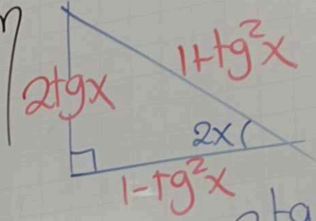
- $Sen(A \pm B) = SenA\, CosB \pm SenB\, CosA$
- $Cos(A \pm B) = CosA\, CosB \mp SenA\, SenB$
- $tg(A \pm B) = \dfrac{tgA \pm tgB}{1 \mp tgA \cdot tgB}$
- $Ctg(A \pm B) = \dfrac{CtgA\, CtgB \mp 1}{CtgB \pm CtgA}$

(B) Identidades Auxiliares

- $Sen(A+B) + Sen(A-B) = 2 SenA\, CosB$
- $Sen(A+B) - Sen(A-B) = 2 SenB \cdot CosA$
- $Cos(A+B) + Cos(A-B) = 2 CosA \cdot CosB$
- $Cos(A+B) - Cos(A-B) = -2 SenA\, SenB$
- $Sen(A+B) \cdot Sen(A-B) = Sen^2A - Sen^2B$
- $Cos(A+B) \cdot Cos(A-B) = Cos^2A - Sen^2B$

$tgA \pm tgB = tg(A \pm B) \mp tg(A \pm B) \cdot tgA \cdot tgB$





ARCOS DOBLES

- $Sen2x = 2SenxCosx$
- $Cos2x = Cos^2x - Sen^2x$
  $= 1 - 2Sen^2x$
  $= 2Cos^2x - 1$
- $tg2x = \dfrac{2tgx}{1-tg^2x}$

- $Sen2x = \dfrac{2tgx}{1+tg^2x}$
- $Cos2x = \dfrac{1-tg^2x}{1+tg^2x}$

MACIA: GAY

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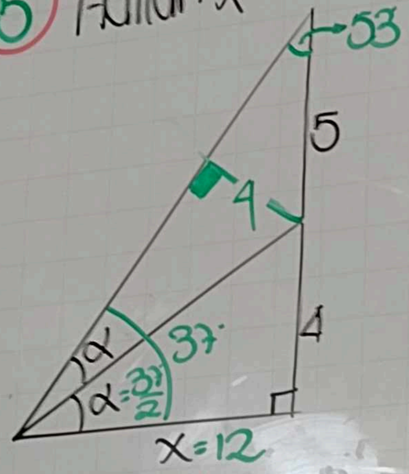
15 Hallar: x



$\cdot \ tg2\alpha = \frac{2tg\alpha}{1-tg^2\alpha}$

$$\frac{9}{x} = \frac{2\left(\frac{4}{x}\right)}{1-\left(\frac{4}{x}\right)^2}$$

$$\frac{9}{x} = \frac{\frac{8}{\cancel{x}}}{\frac{x^2-16}{\cancel{x^2}}}$$

$x = 12$

r:

$\alpha + Sen\alpha$

$\alpha + 1$

$cos\alpha + Sen\alpha$

$os\alpha + 1$

$\frac{(cos\alpha + 1)}{s\alpha + 1} = Sen\alpha$ #

$= 0,6$

$Su^2 - 1 \quad \frac{25}{25}$

-1

$= -\frac{7}{25}$ #

ar:

$$\frac{\ldots 70° - tg50°}{\ldots° + tg50°}$$

$$\frac{\ldots - tg50°}{1}$$

$$+ \frac{tg50°}{tg70°}\cdot tg70°$$

$$\ldots tg50°)\, tg70°$$

$$\ldots tg70°$$

$$\ldots 50°)$$

$$\ldots g70° = 1 \quad \#$$

⑤ Hallar:

$$\cdot\ E = Sec28°\cdot Sec17° + \sqrt{2}\, tg28°\cdot tg17°$$

$$E = \frac{2}{2\cos 28°\cdot \cos 17°} + \sqrt{2}\,\frac{2\,Sen28°\cdot Sen17°}{2\cos 28°\cdot \cos 17°}$$

$$* \cos(A+B) + \cos(A-B) = 2\cos A\cos B$$

$$* \cos(A+B) - \cos(A-B) = -2\,Sen A\, Sen B$$

$$* \cos(A-B) - \cos(A+B) = 2\,Sen A\, Sen B$$

$$E = \frac{2 + \sqrt{2}\,(\cos 11° - \underbrace{\cos 45°}_{\frac{\sqrt{2}}{2}})}{\underbrace{\cos 45°}_{\frac{1}{\sqrt{2}} = \frac{\sqrt{2}}{2}} + \frac{\cos 11°\cdot\sqrt{2}}{\sqrt{2}}}$$

$$E = \frac{2 + \sqrt{2}\cos 11° - 1}{\frac{1 + \sqrt{2}\cos 11°}{\sqrt{2}}} = \frac{\sqrt{2}\,\cancel{(1 + \sqrt{2}\cos 11°)}}{\cancel{1 + \sqrt{2}\cos 11°}}$$

$$E = \sqrt{2} \quad \#$$

⑬ Reducir:

$$H = \frac{Sen2\alpha + Sen\alpha}{2\cos\alpha + 1}$$

$$H = \frac{2Sen\alpha\cos\alpha + Sen\alpha}{2\cos\alpha + 1}$$

$$H = \frac{Sen\alpha\,(2\cos\alpha + 1)}{2\cos\alpha + 1} = Sen\ldots$$

⑭ Si: $\cos u = 0{,}6$

$$\cdot\ \cos 2u = 2\cos^2 u - 1$$

$$= 2(0{,}6)^2 - 1$$

$$= 2\left(\frac{3}{5}\right)^2 - 1 = -\frac{7}{25} \quad \#$$

$$\frac{25}{25}$$

② Calcula:

$$\cdot E = (tg80° - tg20°) - \sqrt{3}\, tg80° \cdot tg20°$$

$$E = \left(\underbrace{\frac{tg(80-20)}{\sqrt{3}}}\ + \underbrace{\frac{tg(80-20)}{\sqrt{3}}} \cdot \cancel{tg80 \cdot tg20}\right) - \cancel{\sqrt{3}\, tg80 \cdot tg20}$$

$$E = \sqrt{3}$$ #

③ Calcular:

$$\cdot E = \frac{Ctg88°}{Ctg44° - Ctg46°}$$

46 - 44

$$E = \frac{tg2°}{tg46° - tg44°}$$

$$E = \frac{\frac{tg46 - tg44}{1 + (tg46 \cdot tg44) = 1}}{\frac{tg46 - tg44}{1}}$$

$$E = \frac{1}{2}$$ #

$\alpha + \theta = 90°$

- $\operatorname{Sen}\alpha = \cos\theta$
- $tg\alpha = Ctg\theta$
- $\operatorname{Sec}\alpha = \operatorname{Csc}\theta$

$\operatorname{Sen}\alpha \cdot \operatorname{Sec}\theta = 1$

$tg\alpha \cdot tg\theta = 1$ ✓

$Ctg\alpha \cdot Ctg\theta = 1$

$\operatorname{Csc}\alpha \cdot \cos\theta = 1$

$$tg\alpha = \frac{1}{tg\theta}$$

④ Calcular:

$$E = \frac{tg70° - tg50°}{tg20° + tg50°}$$

$$E = \frac{\frac{tg70° - tg50°}{1}}{\frac{1}{tg70°} + \frac{tg50°}{tg70°} \cdot tg70°}$$

$$E = \underbrace{\left[\frac{(tg70° - tg50°)}{1 + tg50° \cdot tg70°}\right]}_{tg(70-50°)} tg70°$$

$$E = tg20° \cdot tg70° = 1$$ #

PROBLEMAS DE CLASE

bien....

1 Calcular:

$$E = \frac{\sqrt{3}\,\text{Cos}70^\circ}{\text{Cos}25^\circ - \text{Sen}25^\circ} = \frac{\sqrt{3}\,\text{Cos}(45^\circ + 25^\circ)}{\text{Cos}25^\circ - \text{Sen}25^\circ}$$

$\text{Cos}70^\circ \rightarrow (45^\circ + 25^\circ)$

$* \text{Sen}(45^\circ + x) = \frac{\sqrt{2}}{2}(\text{Cos}x + \text{Sen}x)$

$* \text{Cos}(45^\circ + x) = \frac{\sqrt{2}}{2}(\text{Cos}x - \text{Sen}x)$ ✓

$\underbrace{\text{Sen}45^\circ}_{\frac{\sqrt{2}}{2}}\text{Cos}x + \text{Sen}x . \underbrace{\text{Cos}45^\circ}_{\frac{\sqrt{2}}{2}}$

$\frac{\sqrt{2}}{2}(\text{Cos}x + \text{Sen}x)$

$$E = \frac{\sqrt{3}\left[\frac{\sqrt{2}}{2}\cancel{(\text{Cos}25^\circ - \text{Sen}25^\circ)}\right]}{\cancel{\text{Cos}25^\circ - \text{Sen}25^\circ}}$$

$$E = \frac{\sqrt{6}}{2}$$ //

1→53

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16) Reducir:

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

$$J = \frac{\cancel{1}-(\cancel{1}-\cancel{2}\operatorname{sen}^2\alpha)}{\cancel{2}\operatorname{sen}\alpha\cos\alpha}$$

$$J = \frac{\operatorname{sen}^2\alpha}{\operatorname{sen}\alpha\cos\alpha} = \frac{\operatorname{sen}\alpha}{\cos\alpha}$$

$$J = \operatorname{tg}\alpha \;\#$$

17) Reducir:

$$A = \frac{1-\cos 2\alpha}{1+\cos 2\alpha}$$

$$\underbrace{\qquad\qquad}$$

$$A = \operatorname{tg}^2\alpha \;\#$$

$$\left\{\begin{array}{l} \cdot\ \operatorname{tg}\frac{x}{2} = \pm\sqrt{\frac{1-\cos x}{1+\cos x}} \\ \cdot\ \operatorname{ctg}\frac{x}{2} = \pm\sqrt{\frac{1+\cos x}{1-\cos x}} \end{array}\right.$$

$$A = \frac{\cancel{1}-(\cancel{1}-2\operatorname{sen}^2\alpha)}{\cancel{1}+(2\cos^2\alpha-\cancel{1})} = \frac{2\operatorname{sen}^2\alpha}{2\cos^2\alpha}$$

$$A = \operatorname{tg}^2\alpha \;\#$$

(18) Simplificar:

$$Q = \frac{1-tg^2\alpha}{1+tg^2\alpha} = \frac{\frac{c^2}{c^2} - \frac{s^2}{c^2}}{\frac{c^2}{c^2} + \frac{s^2}{c^2}}$$

$$Q = \frac{Cos^2\alpha - Sen^2\alpha}{Cos^2\alpha + Sen^2\alpha} = Cos2x$$

*

(27) Reducir:

$$K = \frac{2Csc\phi - \frac{1}{2}tg\left(\frac{\phi}{2}\right)}{\frac{1}{2}tg\left(\frac{\phi}{2}\right) + 2Ctg\phi}$$

$$K = \frac{2Csc\phi - tg(\phi/2)}{tg(\phi/2) + 2Ctg\phi}$$

$$tg\frac{x}{2} = Cscx - Ctgx$$

$$Ctg\frac{x}{2} = Cscx + Ctgx$$

$$K = \frac{2Csc\phi - (Csc\phi - Ctg\phi)}{Csc\phi - Ctg\phi + 2Ctg\phi} = 1$$

*

(30) Simplificar:

$$E = Sen2\phi \cdot \frac{1-tg^4\phi}{4tg^2\phi}$$

$$E = Sen2\phi \; \frac{\overbrace{(1+tg^2\phi)}^{Sec^2\phi}}{2tg\phi} \; \underbrace{\frac{(1-tg^2\phi)}{2tg\phi}}_{Ctg2\phi} \rightarrow tg2x = \frac{2tgx}{1-tg^2x}$$

$$E = \cancel{Sen2\phi} \cdot \frac{Cos2\phi}{\cancel{Sen2\phi}} \cdot \frac{\frac{1}{Cos\phi \cdot Cos\phi}}{\frac{2Sen\phi}{Cos\phi}}$$

$$E = \frac{Cos2\phi}{Sen2\phi} = Ctg2\phi$$

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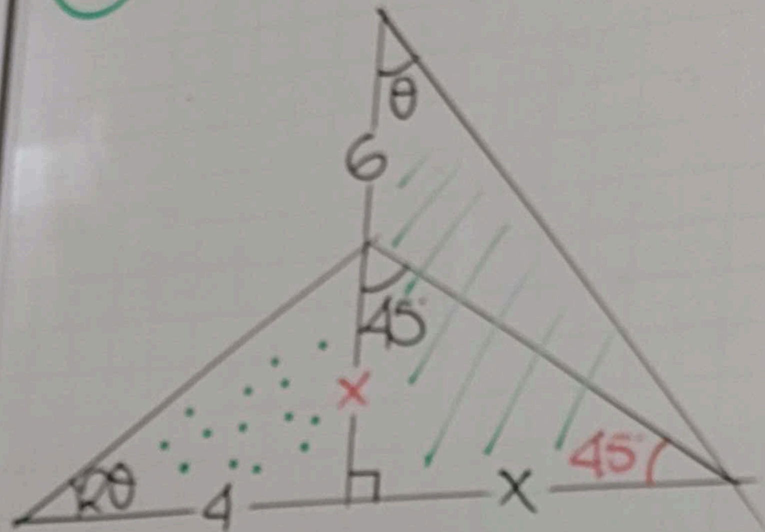
32 Calcule: x



$$\cdot\, tg2\theta = \frac{2tg\theta}{1-tg^2\theta}$$

$$\frac{x}{4} = \frac{2\left(\frac{x}{6+x}\right)}{1-\left(\frac{x}{6+x}\right)^2} \Rightarrow x=3$$

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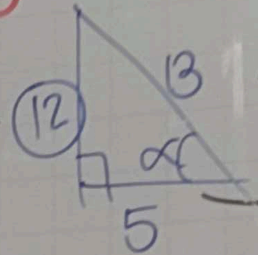
31) Si: $\cos^2\alpha = \frac{25}{169}$; $\alpha \in IIC$

$\cos\alpha = -\frac{5}{13}$

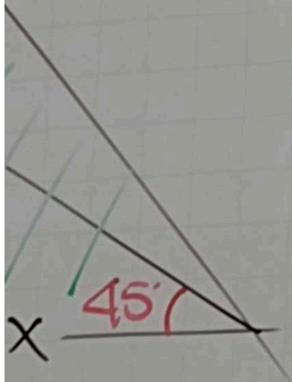


Calcular: $\operatorname{tg}\left(\frac{\alpha}{2}\right) = \operatorname{Csc}\alpha - \operatorname{Ctg}\alpha$

$= \frac{13}{12} - \left(-\frac{5}{12}\right)$

$= \frac{13}{12} + \frac{5}{12}$

$= \frac{18}{12} = \frac{3}{2}$ #.



$= 3$ #