



Materiales Educativos GRATIS

TRIGONOMETRIA

QUINTO

EJERCICIOS DE ÁNGULOS COMPUESTOS

Básicamente la utilidad de estas identidades radica en que con ellas se pueden calcular razones trigonométricas de ángulos desconocidos a partir de ángulos cuyas razones sean conocidas. Si deseo calcular el $\text{Sen}67^\circ$ simplemente bastará con descomponer el ángulo como $\text{Sen}(30^\circ + 37^\circ)$ y aplicar la definición.

I. Seno de la suma y de la diferencia de dos ángulos.

$$\begin{aligned}\text{Sen}(\alpha + \theta) &= \text{Sen}\alpha\text{Cos}\theta + \text{Cos}\alpha\text{Sen}\theta \\ \text{Sen}(\alpha - \theta) &= \text{Sen}\alpha\text{Cos}\theta - \text{Cos}\alpha\text{Sen}\theta\end{aligned}$$

II. Coseno de la suma y de la diferencia de dos ángulos.

$$\begin{aligned}\text{Cos}(\alpha + \theta) &= \text{Cos}\alpha\text{Cos}\theta - \text{Sen}\alpha\text{Sen}\theta \\ \text{Cos}(\alpha - \theta) &= \text{Cos}\alpha\text{Cos}\theta + \text{Sen}\alpha\text{Sen}\theta\end{aligned}$$

III. Tangente de la suma y de la diferencia de dos ángulos.

$$\begin{aligned}\text{Tan}(\alpha + \theta) &= \frac{\text{Tan}\alpha + \text{Tan}\theta}{1 - \text{Tan}\alpha \cdot \text{Tan}\theta} \\ \text{Tan}(\alpha - \theta) &= \frac{\text{Tan}\alpha - \text{Tan}\theta}{1 + \text{Tan}\alpha \cdot \text{Tan}\theta}\end{aligned}$$

Aplicación

Calcula aproximadamente $\text{Sen}67^\circ$.

$$\text{Sen}67^\circ = \text{Sen}(30^\circ + 37^\circ)$$

$$\text{Sen}67^\circ = \text{Sen}30^\circ \text{Cos}37^\circ + \text{Cos}30^\circ \text{Sen}37^\circ$$

$$\text{Sen}67^\circ = \frac{1}{2} \cdot \frac{4}{5} + \frac{\sqrt{3}}{2} \cdot \frac{3}{5}$$

$$\therefore \text{Sen}67^\circ = \frac{4 + 3\sqrt{3}}{10}$$

Trabajando en clase

Integral

1. Calcula $A = \text{Sen}75^\circ$
2. Calcula $B = \text{Tan}8^\circ$
3. Calcula el equivalente de:
 $J = \text{Sen}3^\circ \text{Cos}34^\circ + \text{Cos}3^\circ \text{Sen}34^\circ$

PUCP

4. Reduce la siguiente expresión:

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

Resolución:

$$A = \frac{\text{Cos}x\text{Cos}y - \text{Sen}x\text{Sen}y + \text{Sen}x\text{Sen}y}{\text{Cos}x\text{Sen}y}$$

$$A = \frac{\cancel{\text{Cos}x}\text{Cos}y}{\cancel{\text{Cos}x}\text{Sen}y} \Rightarrow A = \frac{\text{Cos}y}{\text{Sen}y}$$

$$\therefore A = \text{Coty}$$

5. Reduce:

$$A = \frac{\text{Sen}(x + y) + \text{Sen}(x - y)}{\text{Cos}(x - y) - \text{Cos}(x + y)}$$

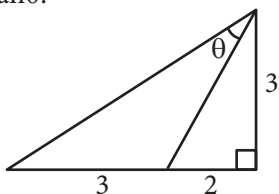
6. Si $\text{Tan}(2\alpha - \beta) = 3$ y $\text{Tan}(2\beta - \alpha) = -2$
Calcula $\text{Tan}(\alpha + \beta)$

7. Calcula «m»

$$\text{Si: } m\text{Tan}50^\circ = \text{Tan}70^\circ - \text{Tan}20^\circ$$

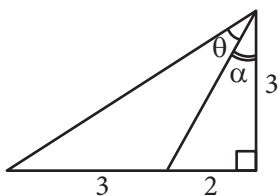
UNMSM

8. Calcula: $\text{Tan}\theta$.



Resolución:

De la figura, $\text{Tan}(\theta + \alpha) = \frac{5}{3} \wedge \text{Tan}\alpha = \frac{2}{3}$



$$\frac{\text{Tan}\theta + \text{Tan}\alpha}{1 - \text{Tan}\theta\text{Tan}\alpha} = \frac{5}{3}$$

$$3\text{Tan}\theta + 3\text{Tan}\alpha = 5 - 5\text{Tan}\theta\text{Tan}\alpha$$

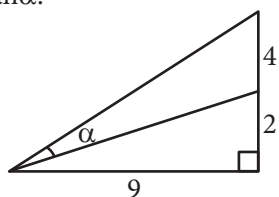
$$3\text{Tan}\theta + 3\left(\frac{2}{3}\right) = 5 - 5\text{Tan}\theta\left(\frac{2}{3}\right)$$

$$9\text{Tan}\theta + 6 = 15 - 10\text{Tan}\theta$$

$$19\text{Tan}\theta = 9$$

$$\therefore \text{Tan}\theta = \frac{9}{19}$$

9. Calcula $\text{Tan}\alpha$.



10. Calcula:

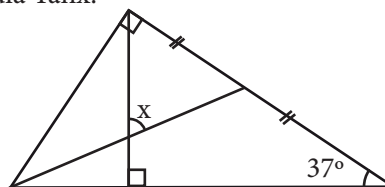
$$E = \frac{\sqrt{3}\text{Sen}50^\circ - \text{Cos}50^\circ}{\text{Sen}25^\circ - \text{Cos}25^\circ}$$

11. Calcula:

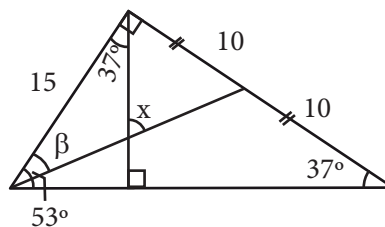
$$M = \frac{\text{Tan}50^\circ - \text{Tan}40^\circ}{\text{Tan}10^\circ}$$

UNI

12. Calcula $\text{Tan}x$.



Resolución:



De la figura:

$$x = 37^\circ + \beta \wedge \text{Tan}\beta = \frac{10}{15} = \frac{2}{3}$$

$$\text{Tan}x = \text{Tan}(37^\circ + \beta)$$

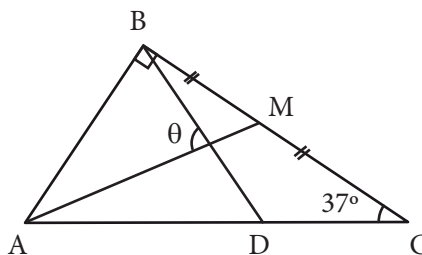
$$\text{Tan}x = \frac{\text{Tan}37^\circ + \text{Tan}\beta}{1 - \text{Tan}37^\circ \text{Tan}\beta}$$

$$\text{Tan}x = \frac{\frac{3}{4} + \frac{2}{3}}{1 - \frac{3}{4}\left(\frac{2}{3}\right)}$$

$$\text{Tan}x = \frac{\frac{17}{8}}{\frac{6}{8}}$$

$$\text{Tan}x = \frac{17}{8}$$

13. Calcula $\text{Tan}\theta$, si $\overline{AD} = 2\overline{DC}$



14. Si:

$$\text{Sen}4 + \text{Cos}3 = x$$

$$\text{Sen}3 - \text{Cos}4 = y$$

Calcula $\text{Sen}1$