

SEMANA 3 TRIGONOMETRÍA

1 DATO: $\cos x = \frac{2}{3}$

PIDEN:

$$\cos 3x = 4\cos^3 x - 3\cos x$$

$$= 4\left(\frac{2}{3}\right)^3 - 3\left(\frac{2}{3}\right)$$

$$= \frac{32}{27} - 2$$

$$\cos 3x = -\frac{22}{27}$$

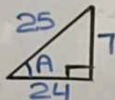
2 $\sin 2\theta = 2\sin\theta \cdot \cos\theta$
 $\tan x + \cot x = 2\csc 2x$

$$E = \frac{\sin x \cdot \cos x \cdot \tan x}{\sin 2x} + \frac{\cot x}{2}$$

$$E = \frac{\tan x + \cot x}{2} = \frac{2\csc 2x}{2}$$

$$\therefore E = \csc 2x$$

3 $\cos 2\theta = 1 - 2\sin^2\theta$

$$\sin A = \frac{7}{25}$$


PIDEN:

$$\sin 2A + \cos 2A$$

$$2\sin A \cdot \cos A + 1 - 2\sin^2 A$$

$$2\left(\frac{7}{25}\right) \cdot \left(\frac{24}{25}\right) + 1 - 2\left(\frac{7}{25}\right)^2$$

$$\frac{336}{625} + 1 - \frac{98}{625}$$

$$\frac{863}{625}$$

4 $\sin 3\theta = 3\sin\theta - 4\sin^3\theta$

$$\frac{\sin 3x + \sin^3 x}{\cos^3 x - \cos 3x}$$

$$\frac{3\sin x - 4\sin^3 x + \sin^3 x}{\cos^3 x - (4\cos^3 x - 3\cos x)}$$

$$\frac{\cancel{3}\sin x - \cancel{3}\sin^3 x}{\cancel{3}\cos x - \cancel{3}\cos^3 x}$$

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

$$\frac{\cancel{\sin x} \cdot \cos^2 x}{\cancel{\cos x} \cdot \sin^2 x}$$

$$\frac{\cos x}{\sin x}$$

$$\cot x$$

5 $\sin A + \sin B = 2\sin\left(\frac{A+B}{2}\right) \cdot \cos\left(\frac{A-B}{2}\right)$
 $\cos A + \cos B = 2\cos\left(\frac{A+B}{2}\right) \cdot \cos\left(\frac{A-B}{2}\right)$

$$Q = \frac{\sin 3x + \sin x}{\cos 3x + \cos x}$$

$$= \frac{2\sin 2x \cdot \cos x}{2\cos 2x \cdot \cos x}$$

$$Q = \tan 2x$$

6 $\cos 2x = 2\cos^2 x - 1 = \cos^2 x - \sin^2 x$

$$\frac{1 - \cos 2x}{\sin x} - \frac{2\cos^2 x - 1}{\cos x + \sin x}$$

$$\frac{2\sin^2 x}{\sin x} - \frac{\cos^2 x - \sin^2 x}{\cos x + \sin x}$$

$$2\sin x - (\cos x - \sin x)$$

$$2\sin x - \cos x + \sin x$$

$$3\sin x - \cos x$$

10 $\tan \frac{x}{2} =$
 $\cot \frac{x}{2} =$
 $P + \cot \frac{x}{2} =$

$$\frac{C(A-B)}{2}$$

$$\frac{C(A-B)}{2}$$

$$\frac{4x}{x}$$

$$C^2x - S^2x$$

$$\frac{1}{\sin x}$$

$$\frac{N^2x}{N^2x}$$

10

$$\tan \frac{x}{2} = \csc x - \cot x$$

$$\cot \frac{x}{2} = \csc x + \cot x$$

$$P + \cot 16x = \csc x + \csc 2x + \csc 4x + \csc 8x + \csc 16x + \cot 16x$$

$$\underbrace{\qquad\qquad\qquad}_{\cot x} \underbrace{\qquad\qquad\qquad}_{\cot 2x} \underbrace{\qquad\qquad\qquad}_{\cot 4x} \underbrace{\qquad\qquad\qquad}_{\cot 8x}$$

$$\cot \frac{x}{2}$$

$$\Rightarrow P + \cot 16x = \cot \frac{x}{2}$$

$$P = \cot \frac{x}{2} - \cot 16x$$

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$$\cos A - \cos B = -2 \sin \left(\frac{A+B}{2} \right) \sin \left(\frac{A-B}{2} \right)$$

$$E = \frac{\cos 65^\circ - \cos 5^\circ}{\sin 65^\circ + \sin 5^\circ}$$

$$E = \frac{-2 \sin 35^\circ \sin 30^\circ}{2 \sin 35^\circ \cos 30^\circ}$$

$$E = -\tan 30^\circ$$

$$\therefore E = -\frac{\sqrt{3}}{3}$$

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

$$\text{DITO: } \cos 70^\circ = k$$

PIDEN:

$$E = \sin^2 25^\circ - \sin^2 5^\circ$$

$$= \sin 30^\circ \sin 20^\circ$$

$$\frac{1}{2} \cdot \frac{\cos 70^\circ}{k}$$

$$\therefore E = \frac{k}{2}$$

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$$P = \sin 0^\circ + \sin 30^\circ - \sin 50^\circ + \sin 90^\circ$$

$$P = 2 \sin 50^\circ \cos 40^\circ + 2 \cos 40^\circ \sin(-10^\circ)$$

$$P = 2 \cos 40^\circ (\sin 50^\circ - \sin 10^\circ)$$

$$2 \cos 30^\circ \sin 20^\circ$$

$$P = 4 \cos 40^\circ \cos 30^\circ \sin 20^\circ$$

$$CS = \langle -8, -1 \rangle \cup \langle 8, 1 \rangle$$

SEMANA 3
TRIGONOMETRÍA

20 $\cos \theta = 0,75 = \frac{3}{4}$

$R = 32 \cdot \sin \frac{3\theta}{2} \cdot \sin \frac{\theta}{2}$

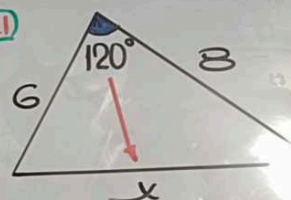
$R = 16 \cdot 2 \sin \frac{3\theta}{2} \cdot \sin \frac{\theta}{2}$
 $\cos \theta = \frac{\cos 2\theta}{2\cos^2 \theta - 1}$

$R = 16 \left[\frac{3}{4} - 2 \left(\frac{3}{4} \right)^2 + 1 \right]$

$R = 10$

$2 \sin A \cdot \sin B = \cos(A-B) - \cos(A+B)$

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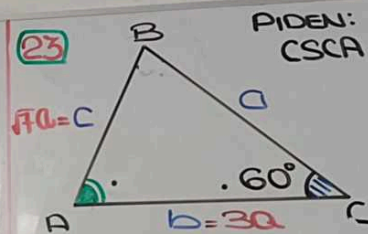
$x^2 = 6^2 + 8^2 - 2(6)(8) \cdot \cos 120^\circ$
 $- \frac{1}{2}$

$x^2 = 100 + 48$

$x^2 = 148$

$x = 2\sqrt{37}$

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LEY DE COSENOS:

$c^2 = a^2 + (3a)^2 - 2(a)(3a) \cdot \cos 60^\circ$
 $- \frac{1}{2}$

$c^2 = 7a^2 \rightarrow c = \sqrt{7}a$

LEY DE SENOS

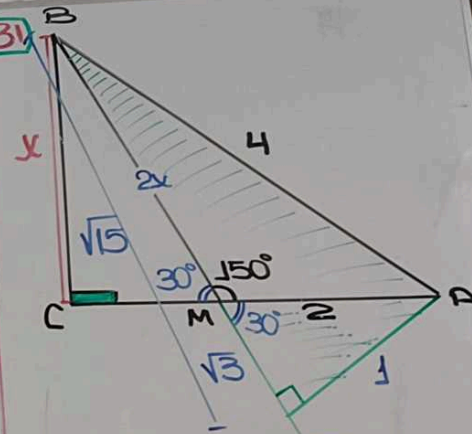
$\frac{a}{\sin A} = \frac{\sqrt{7}a}{\sin 60^\circ}$

$\text{CSCA} = \frac{\sqrt{7}}{\frac{\sqrt{3}}{2}}$

$\text{CSCA} = \frac{2\sqrt{7}}{\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}}$

$\text{CSCA} = \frac{2\sqrt{21}}{3}$

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$2x + \sqrt{3} = \sqrt{15}$

$x = \frac{\sqrt{15} - \sqrt{3}}{2}$