Treceava Práctica Dirigida de Trigonometría

Tema : Inecuaciones Trigonométricas

1.- Resolver:

$$\sqrt{2+tgx}+\sqrt{2-tgxz}=\sqrt{2}.tgx$$

A) $k\pi; k \in Z$

B) $k\pi + \dfrac{\pi}{2}; k \in Z$

C) $k\pi + \dfrac{\pi}{3}; k \in Z$

D) $k\pi + \dfrac{\pi}{4}; k \in Z$

E) $k\pi + \dfrac{\pi}{5}; k \in Z$

2.- Resolver:

$$x - y = \dfrac{\pi}{3}$$

$$senx = 2seny$$

A) $x = n\pi + \dfrac{\pi}{2}$; $y = n\pi + \dfrac{\pi}{6}$

B) $x = n\pi + \dfrac{\pi}{3}$; $y = n\pi + \dfrac{\pi}{6}$

C) $x = n\pi + \dfrac{\pi}{6}$; $y = n\pi + \dfrac{\pi}{2}$

D) $x = n\pi - \dfrac{\pi}{6}$; $y = n\pi - \dfrac{\pi}{6}$

E) $x = n\pi - \dfrac{\pi}{3}$; $y = n\pi - \dfrac{2\pi}{6}$

3.- Resolver la inecuación:

$$sen\dfrac{x}{3} \geq sen\dfrac{\pi}{4}$$

A) $\left[6k\pi + \dfrac{\pi}{4}; 6k\pi + \dfrac{3\pi}{4}\right]; k \in Z$

B) $\left[6k\pi + \dfrac{3\pi}{4}; 6k\pi + \dfrac{9\pi}{4}\right]; k \in Z$

C) $\left[6k\pi - \dfrac{3\pi}{4}; 6k\pi + \dfrac{3\pi}{4}\right]; k \in Z$

D) $\left[3k\pi + \dfrac{\pi}{4}; 3k\pi + \dfrac{3\pi}{4}\right]; k \in Z$

E) $\left[3k\pi + \dfrac{9\pi}{4}; 3k\pi + \dfrac{11\pi}{4}\right]; k \in Z$

4.- Resolver: $senx.\cos 2x > 0$ .Si: $x \in \langle 0; \pi \rangle$

A) $\left\langle 0; \dfrac{\pi}{4}\right\rangle$ B) $\left\langle \dfrac{\pi}{4}; \dfrac{\pi}{2}\right\rangle$ C) $\left\langle \dfrac{3\pi}{4}; \pi\right\rangle$

D) $\left\langle 0; \dfrac{\pi}{4}\right\rangle U \left\langle \dfrac{3\pi}{4}; \pi\right\rangle$ E) $\left\langle \dfrac{\pi}{4}; \dfrac{\pi}{2}\right\rangle U \left\langle \dfrac{3\pi}{4}; \pi\right\rangle$

5.- Resolver la inecuación:

$$tgx + ctgx < tg\dfrac{\pi}{4}$$

en el intervalo <0; 2π >

A) $< 0; \dfrac{\pi}{2} > \cup < \pi; \dfrac{3\pi}{2} >$

B) $< \dfrac{\pi}{2}; \pi > \cup < \dfrac{3\pi}{2} 2\pi >$

C) $< 0; \pi > - \left\{\dfrac{\pi}{2}\right\}$

D) $< \pi; 2\pi > - \left\{\dfrac{3\pi}{2}\right\}$

E) $< 0; \dfrac{\pi}{2} >$

6.- Resolver en $[0; 2\pi]$ **. Si:** $sen2x > senx$

A) $\left\langle 0; \dfrac{\pi}{6}\right\rangle U \left\langle \dfrac{5\pi}{6}; \pi\right\rangle$

B) $\left\langle 0; \dfrac{\pi}{3}\right\rangle U \left\langle \pi; \dfrac{4\pi}{3}\right\rangle$

C) $\left\langle 0; \dfrac{\pi}{3}\right\rangle U \left\langle \pi; \dfrac{5\pi}{3}\right\rangle$

D) $\left\langle 0; \dfrac{\pi}{6}\right\rangle U \left\langle \pi; \dfrac{7\pi}{6}\right\rangle$

E) $\left\langle 0; \dfrac{\pi}{6}\right\rangle U \left\langle \dfrac{7\pi}{6}; 2\pi\right\rangle$

7.- Dada la función :

$$f(x) = 1 + senx + \cos 2x + sen3x$$

Hallar el dominio de la función para que su rango adopte solo valores negativos

A) $\left\langle \dfrac{\pi}{2}; \dfrac{3\pi}{2}\right\rangle - \{\pi\}$ B) $\left\langle \dfrac{7\pi}{6}; \dfrac{11\pi}{6}\right\rangle - \left\{\dfrac{3\pi}{2}\right\}$

C) $\left\langle \dfrac{\pi}{2}; \dfrac{3\pi}{2}\right\rangle$ D) $\left\langle \dfrac{7\pi}{6}; \dfrac{11\pi}{6}\right\rangle$

E) $\left\langle \dfrac{4\pi}{3}; \dfrac{5\pi}{3}\right\rangle - \left\{\dfrac{3\pi}{2}\right\}$

8.- Resolver: $\cos^2 2x + \cos^2 x \leq 1$

A) $\left[n\pi + \dfrac{\pi}{3}; n\pi + \dfrac{5\pi}{3}\right]; n \in Z$

B) $\left[n\pi - \dfrac{\pi}{3}; n\pi + \dfrac{\pi}{3}\right]; n \in Z$

C) $\left[n\pi - \dfrac{\pi}{6}; n\pi + \dfrac{\pi}{6}\right]; n \in Z$

D) $\left[n\pi + \dfrac{\pi}{6}; n\pi + \dfrac{5\pi}{6}\right]; n \in Z$

E) $\left[n\pi + \dfrac{\pi}{2}; n\pi + \dfrac{3\pi}{4}\right]; n \in Z$

9.- Resolver:

$$2sen^2 x - \sqrt{3}senx.\cos x + \cos^2 x \leq 1$$

A) $k\pi \leq x \leq k\pi + \dfrac{\pi}{3}; k \in Z$

B) $k\pi \leq x \leq \dfrac{k\pi}{2} + \dfrac{\pi}{3}; k \in Z$

C) $k\pi + \dfrac{\pi}{3} \leq x \leq k\pi + \dfrac{2\pi}{3}; k \in Z$

D) $\dfrac{k\pi}{2} + \dfrac{\pi}{3} \leq x \leq \dfrac{k\pi}{2} + \dfrac{2\pi}{3}; k \in Z$

E) $k\pi + \dfrac{\pi}{6} \leq x \leq k\pi + \dfrac{5\pi}{6}; k \in Z$

10.- Resolver :

$$\cos x + \sec x + 2 \geq 0; (k \in Z)$$

A) $2k\pi + \dfrac{\pi}{2} < x < 2k\pi + \dfrac{3\pi}{2} \vee x = (2k+1)\pi$

B) $k\pi + \dfrac{\pi}{2} < x < k\pi + \dfrac{3\pi}{2} \vee x = 2k\pi$

C) $2k\pi < x < 2k\pi + \dfrac{\pi}{2} \vee x = 2k\pi$

D) $k\pi + \dfrac{\pi}{4} < x < k\pi + \dfrac{5\pi}{4} \vee x = k\pi$

E) $2k\pi - \dfrac{\pi}{2} < x < 2k\pi + \dfrac{\pi}{2} \vee x = (2k+1)\pi$

11.- Señale un conjunto solución de:

$$senx.\cos^3 x - sen^3 x.\cos x \geq 0.125$$

A) $\left\langle \dfrac{\pi}{4}; \dfrac{\pi}{2}\right\rangle$ B) $\left[\dfrac{\pi}{4}; \dfrac{\pi}{2}\right]$ C) $\left[\dfrac{\pi}{24}; \dfrac{5\pi}{2}\right]$

D) $\left[\dfrac{13\pi}{24}; \dfrac{17\pi}{24}\right]$ E) $\left\langle \dfrac{13\pi}{24}; \dfrac{3\pi}{4}\right\rangle$

12.- Resolver: $tg2x \geq 2tgx$ **en** $[0; \pi]$

A) $[0; \dfrac{\pi}{4} >$ B) $\left\langle \dfrac{\pi}{4}; \dfrac{\pi}{2}\right\rangle$ C) $\left\langle \dfrac{3\pi}{4}; \pi\right\rangle$

D) $\left\langle \dfrac{\pi}{2}; \dfrac{3\pi}{4}\right\rangle$ E) "A" y "D" son respuestas.

13.- Si $x \in [\pi; 2\pi]$**, calcular.**

"$x_{máx}.x_{mín}$" si son soluciones de la inecuación :

$$2sen^2 x \geq 1 + senx$$

A) 0   B) $\dfrac{20\pi^2}{9}$ C) $\dfrac{35\pi^2}{16}$ D) $\dfrac{77\pi^2}{36}$

E) $\dfrac{7\pi^2}{8}$

14.- Resolver en $\langle 0; 2\pi \rangle$ **.** $tg^3 x < tgx$

A) $\left\langle 0; \dfrac{\pi}{4}\right\rangle \cup \left\langle \dfrac{\pi}{2}; \dfrac{3\pi}{4}\right\rangle \cup \left\langle \pi; \dfrac{5\pi}{4}\right\rangle \cup \left\langle \dfrac{3\pi}{2}; \dfrac{7\pi}{4}\right\rangle$

(viene de preguntas 6)

C) $\left\langle 0; \dfrac{\pi}{3}\right\rangle U \left\langle \pi; \dfrac{5\pi}{3}\right\rangle$

D) $\left\langle 0; \dfrac{\pi}{6}\right\rangle U \left\langle \pi; \dfrac{7\pi}{6}\right\rangle$

E) $\left\langle 0; \dfrac{\pi}{6}\right\rangle U \left\langle \dfrac{7\pi}{6}; 2\pi\right\rangle$

B) $\left\langle \frac{\pi}{4};\frac{\pi}{2} \right\rangle \cup \left\langle \frac{3\pi}{4};\pi \right\rangle \cup \left\langle \frac{5\pi}{4};\frac{3\pi}{2} \right\rangle$

C) $\left\langle \frac{\pi}{4};\frac{\pi}{2} \right\rangle \cup \left\langle \frac{5\pi}{4};\frac{3\pi}{2} \right\rangle$

D) $\left\langle 0;\frac{\pi}{4} \right\rangle \cup \left\langle \pi;\frac{5\pi}{4} \right\rangle$

E) $\left\langle 0;\frac{\pi}{4} \right\rangle \cup \left\langle \pi;\frac{5\pi}{4} \right\rangle \cup \left\langle \frac{3\pi}{2};\frac{7\pi}{4} \right\rangle$

15.- Para $x \in [0;\pi]$ determine el intervalo de

solución de $tg\left(\frac{\pi}{4} - x \right) < 2 - 3tgx$

A) $\left\langle 0;\frac{\pi}{6} \right\rangle$ **B)** $\left\langle \frac{\pi}{2};\frac{3\pi}{4} \right\rangle$ **C)** $\left\langle \frac{5\pi}{6};\pi \right\rangle$

D) $\left\langle 0;\pi \right\rangle$ **E)** $A \cup B \cup C$

16.- Hallar todos los valores de x tal que:
$sen2x > 6\cos x$, dado $n \in Z$

A) $\left\langle n\pi + \frac{\pi}{3};n\pi + \frac{2\pi}{3} \right\rangle$

B) $\left\langle 2n\pi + \frac{\pi}{2};2n\pi + \frac{3\pi}{2} \right\rangle$

C) $\left\langle 2n\pi + \frac{\pi}{3};2n\pi + \frac{2\pi}{3} \right\rangle$

D) $\left\langle n\pi + \frac{\pi}{2};n\pi + \frac{2\pi}{3} \right\rangle$

E) $\left\langle 2n\pi - \frac{\pi}{2};2n\pi + \frac{\pi}{2} \right\rangle$

17.- Resolver la inecuación en el siguiente

intervalo $\left\langle 0;\frac{\pi}{2} \right\rangle$

$senx.sen2x < sen3x.sen4x$

A) $\left\langle \frac{\pi}{5};\frac{2\pi}{5} \right\rangle$ **B)** $\left\langle 0;\frac{\pi}{5} \right\rangle \cup \left\langle \frac{2\pi}{5};\frac{4\pi}{5} \right\rangle$

C) $\left\langle 0;\frac{\pi}{5} \right\rangle \cup \left\langle \frac{2\pi}{5};\frac{\pi}{2} \right\rangle$ **D)** $\left\langle \frac{\pi}{5};\frac{4\pi}{5} \right\rangle$

E) $\left\langle 0;\frac{\pi}{5} \right\rangle \cup \left\langle \frac{2\pi}{5};\frac{\pi}{2} \right\rangle$

18.- Resolver:
$5sen^2\theta + sen^2 2\theta \geq 4\cos 2\theta$; $k \in Z$

A) $\left[k\pi + \frac{\pi}{6};k\pi + \frac{5\pi}{6} \right]$

B) $\left[\frac{k\pi}{2} + \frac{\pi}{6};\frac{k\pi}{2} + \frac{5\pi}{12} \right]$

C) $\left[2k\pi - \frac{\pi}{6};2k\pi - \frac{5\pi}{6} \right]$

D) $\left\langle k\pi + \frac{\pi}{6};k\pi + \frac{5\pi}{6} \right\rangle$

E) $\left[k\pi - \frac{\pi}{6};k\pi - \frac{5\pi}{6} \right\rangle >$

19.- Resolver la siguiente inecuación:

$\csc 2x + tg2x \geq 0$; para $x \in [\frac{\pi}{2};\pi >$

A) $\left\langle -arccos\left(\frac{\sqrt{5}-1}{2} \right);\frac{3\pi}{4} \right\rangle$

B) $\left[\frac{1}{2}arccos\left(\frac{1-\sqrt{5}}{2} \right);\frac{3\pi}{4} \right\rangle$

C) $\left[arccos\left(\frac{\sqrt{5}-1}{2} \right);\pi \right\rangle$

D) $\left[\pi - \frac{1}{2}arccos\left(\frac{1-\sqrt{5}}{2} \right);\frac{3\pi}{4} \right\rangle$

E) $\left\langle \frac{\pi}{2} - \frac{1}{2}arccos\left(\frac{\sqrt{5}-1}{2} \right);\pi \right\rangle$

20.- Resolver la inecuación :

$3tgx + 4sen^2 \frac{x}{2} < 2$

dar el conjunto solución comprendido en

$\left\langle \frac{5\pi}{2};3\pi \right\rangle$

A) $\left\langle \frac{13\pi}{6};\frac{17\pi}{6} \right\rangle$ **B)** $\left\langle \frac{5\pi}{2};\frac{13\pi}{6} \right\rangle$

C) $\left\langle \frac{13\pi}{6};3\pi \right\rangle$ **D)** $\left\langle \frac{5\pi}{2};\frac{17\pi}{6} \right\rangle$

E) $\left\langle \frac{5\pi}{2};3\pi \right\rangle$

21.- Resolver: $sen2x \geq tgx$; $0 < x < \pi$

A) $\left\langle 0;\frac{\pi}{2} \right\rangle \cup \left\langle \frac{3\pi}{4};\pi \right\rangle$ **B)** $\left\langle 0;\frac{\pi}{4} \right\rangle \cup \left\langle \frac{\pi}{2};\frac{3\pi}{4} \right\rangle$

C) $\left\langle 0;\frac{\pi}{4} \right\rangle \cup \left\langle \frac{3\pi}{4};\pi \right\rangle$ **D)** $\left\langle \frac{\pi}{4};\frac{3\pi}{4} \right\rangle - \left\{ \frac{\pi}{2} \right\}$

E) $\left\langle \frac{\pi}{4};\frac{\pi}{2} \right\rangle \cup \left\langle \frac{\pi}{2};\pi \right\rangle$

22.- Para que valores de x: $0 < x < 2\pi$ se

cumple: $(1 - \cos x + senx)^2 \geq 1 + senx$

A) $\left[\frac{\pi}{3};2\pi \right\rangle$ **B)** $\left\langle 0;\frac{\pi}{3} \right] \cup \left[\frac{5\pi}{3};2\pi \right\rangle$

C) $\left[\frac{\pi}{3};\frac{3\pi}{2} \right\rangle \cup \left\langle \frac{3\pi}{2};\frac{5\pi}{3} \right\rangle$ **D)** $\left[\frac{\pi}{3};\frac{5\pi}{3} \right\rangle$

E) $\left[\frac{\pi}{2};\frac{3\pi}{2} \right\rangle \cup \left[\frac{5\pi}{3};2\pi \right\rangle$

23.- Resolver la inecuación:
$3sen2x + sen4x < tgx$, dar el conjunto

solución comprendido en $\left\langle \frac{\pi}{2};\pi \right\rangle$

A) $\left\langle \frac{\pi}{3};\frac{2\pi}{3} \right\rangle$ **B)** $\left\langle \frac{2\pi}{3};\pi \right\rangle$ **C)** $\left\langle \frac{\pi}{2};\frac{2\pi}{3} \right\rangle$

D) $\left\langle \frac{2\pi}{3};\frac{5\pi}{6} \right\rangle$ **E)** $\left\langle \frac{5\pi}{6};\pi \right\rangle$

24.- Resolver: $sen^2 x + sen2x \leq 3\cos^2 x$, dar
un conjunto solución comprendido en

$\left[-\frac{\pi}{2};\frac{\pi}{2} \right]$.

A) $\left[-arctg3;\frac{\pi}{4} \right]$ **B)** $\left[-arctg3;\frac{\pi}{2} \right]$

C) $\left[arctg3;\frac{\pi}{2} \right]$ **D)** $\left[-\frac{\pi}{4};arctg3 \right]$

E) $\left[-\frac{\pi}{2};arctg3 \right]$

25.- Resolver:
$4\cos^2 x - 2\left(\sqrt{3} + \sqrt{2} \right)\cos x + \sqrt{6} < 0$; si
$x \in [0;2\pi]$

A) $\left\langle \frac{\pi}{6};\frac{\pi}{4} \right\rangle$ **B)** $\left\langle \frac{\pi}{6};\frac{\pi}{3} \right\rangle$ **C)** $\left\langle \frac{\pi}{6};\frac{\pi}{2} \right\rangle$

D) $\left\langle 0;\frac{\pi}{6} \right\rangle \cup \left\langle \frac{\pi}{4};\frac{\pi}{2} \right\rangle$

E) $\left\langle \frac{\pi}{6};\frac{\pi}{4} \right\rangle \cup \left\langle \frac{7\pi}{4};\frac{11\pi}{6} \right\rangle$

26.- Resover: $tg\left(\frac{x}{2} \right) > 1 - ctgx$, si $x \in \left\langle 0;\pi \right\rangle$

A) $\left\langle 0;\frac{\pi}{2} \right\rangle$ **B)** $\left\langle 0;\pi \right\rangle$ **C)** $\left\langle 0;\pi \right\rangle - \frac{\pi}{2}$

D) $\left\langle \frac{\pi}{2};\pi \right\rangle$ **E)** $\left\langle \frac{\pi}{4};\frac{\pi}{2} \right\rangle$

27.- Resolver: $senx.sen3x > sen2x.sen4x$; si
$x \in \left\langle 0;\pi \right\rangle$

A) $\left\langle 0;\pi \right\rangle - \left\{ \frac{\pi}{5},\frac{2\pi}{5},\frac{3\pi}{5} \right\}$

B) $\left\langle \frac{\pi}{5};\frac{2\pi}{5} \right\rangle \cup \left\langle \frac{3\pi}{5};\frac{4\pi}{5} \right\rangle$

C) $\left\langle 0;\pi \right\rangle$ **D)** $\left\langle 0;\frac{2\pi}{5} \right\rangle \cup \left\langle \frac{4\pi}{5};\pi \right\rangle$

E) $\left\langle 0;\frac{\pi}{5} \right\rangle \cup \left\langle \frac{2\pi}{5};\frac{3\pi}{5} \right\rangle \cup \left\langle \frac{4\pi}{5};\pi \right\rangle$

28.- Resolver:
$2\left(sen^6 x + \cos^6 x \right) \geq sen^4 x + \cos^4 x$

A) $2k\pi \pm \frac{\pi}{2};k \in Z$ **B)** $k\pi;k \in Z$

C) $k\pi \pm \frac{\pi}{4};k \in Z$ **D)** R

E) $k\pi \pm \frac{\pi}{2};k \in Z$