

Esercitazione sulle disequazioni goniometriche

1) $2 \cos x + \sqrt{3} \leq 0$

$$S = \bigcup_{k \in \mathbb{Z}} \left[\frac{5\pi}{6} + 2k\pi; \frac{7\pi}{6} + 2k\pi \right]$$

2) $\cos x - \frac{1}{\cos x} \geq 0$

$$S = \bigcup_{k \in \mathbb{Z}} \left(\left[\frac{\pi}{2} + 2k\pi; \frac{3\pi}{2} + 2k\pi \right] \cup \{2k\pi\} \right)$$

3) $\cos x - \sin x > 0$

$$S = \bigcup_{k \in \mathbb{Z}} \left[\frac{\pi}{4} + 2k\pi; \frac{3\pi}{4} + 2k\pi \right]$$

4) $2 \cos^2 x - 1 \leq 0$

$$S = \bigcup_{k \in \mathbb{Z}} \left[-\frac{\pi}{4} + k\pi; \frac{\pi}{4} + k\pi \right]$$

5) $\cos^2 x + 3 \cos x - 4 < 0$

$$S = \mathbb{R} - \{x \mid x = 2k\pi, k \in \mathbb{Z}\}$$

6) $\sin x - \sin\left(\frac{x}{2}\right) > 0$, con $x \in [0; 2\pi]$

$$S = \left] 0; \frac{2}{3}\pi \right[\cup \left] \frac{4}{3}\pi; 2\pi \right[$$

7) $\operatorname{tg} x > \sqrt{3}$

$$S = \bigcup_{k \in \mathbb{Z}} \left] \frac{\pi}{3} + k\pi; \frac{\pi}{2} + k\pi \right[$$

8) $\operatorname{tg} x + \sqrt{3} \leq 0$

$$S = \bigcup_{k \in \mathbb{Z}} \left[\frac{\pi}{2} + k\pi; \frac{2\pi}{3} + k\pi \right]$$

9) $\operatorname{tg}^2 x - \sqrt{3} \operatorname{tg} x \geq 0$, con $x \in [0; 2\pi]$

$$S = \left[\frac{\pi}{3}; \frac{\pi}{2} \right[\cup \left[\frac{\pi}{2}; \pi \right] \cup \left[\frac{4\pi}{3}; \frac{3\pi}{2} \right[\cup \left[\frac{3\pi}{2}; 2\pi \right]$$

10) $(\operatorname{tg} x + \sqrt{3})(2 \sin x - 1) < 0$, con $x \in [0; 2\pi]$

$$S = \left[0; \frac{\pi}{6} \right[\cup \left] \frac{\pi}{2}; \frac{2\pi}{3} \right[\cup \left] \frac{5\pi}{6}; \frac{3\pi}{2} \right[\cup \left] \frac{5\pi}{3}; 2\pi \right]$$

11) $2 \operatorname{tg}^2 x + \sqrt{3} \operatorname{tg} x - 3 < 0$, con $x \in [0; 2\pi]$

$$S = \left[0; \arctg\left(\frac{\sqrt{3}}{2}\right) \right[\cup \left] \frac{2\pi}{3}; \pi + \arctg\left(\frac{\sqrt{3}}{2}\right) \right[\cup \left] \frac{2\pi}{3}; 2\pi \right]$$

12) $3 \operatorname{tg}^2 x - \operatorname{tg} x - 4 \leq 0$

$$S = \bigcup_{k \in \mathbb{Z}} \left[-\frac{\pi}{4} + k\pi; \arctg\left(\frac{4}{3}\right) + k\pi \right]$$

13) $\sqrt{\frac{1}{\sin x}} > 1$, con $x \in [0; 2\pi]$

$$S = \left] 0; \pi \right[- \left\{ \frac{\pi}{2} \right\}$$