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$2\sin^2 x - 2\sin x\cos x + 2\cos^2 x \geq 1$ (2)

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

$\sin^2 x - 2\sin x\cos x + \cos^2 x \geq 0$

$(\sin x - \cos x)^2 \geq 0 \rightsquigarrow \forall x \in \mathbb{R}$

Modo alternativo

$-2\sin x\cos x \geq -1$

$\sin 2x \leq 1$

$\forall x \in \mathbb{R}$

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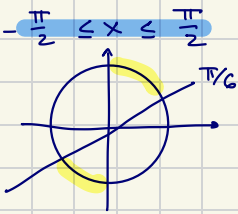
$\frac{3\sin x - \sqrt{3}\cos x}{2\cos x + 1} \leq 0$

$N \geq 0 \quad 3\sin x - \sqrt{3}\cos x \geq 0 \rightsquigarrow$ Divido e moltiplico per $\cos x$

$\cos x(3\tan x - \sqrt{3}) \geq 0$

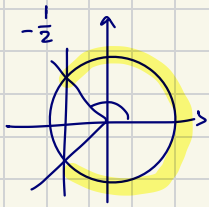
$f_1 \geq 0 \quad \cos x \geq 0 \quad -\frac{\pi}{2} \leq x \leq \frac{\pi}{2}$

$f_2 \geq 0 \quad \tan x \geq \frac{\sqrt{3}}{3}$

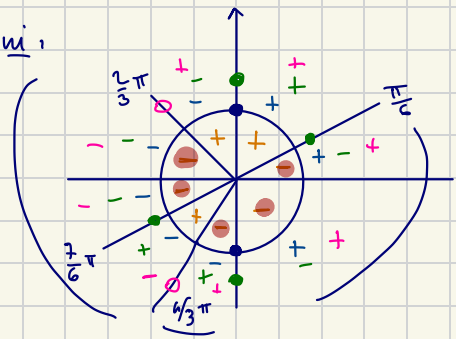


$k\pi + \frac{\pi}{2} < x \leq \frac{\pi}{6} + k\pi$

$D > 0 \quad 2\cos x + 1 > 0 \quad \cos x > -\frac{1}{2} \quad -\frac{2}{3}\pi < x < \frac{2}{3}\pi$



Graf segni:



$2k\pi + \frac{2}{3}\pi < x < \frac{7}{6}\pi + 2k\pi$

$\vee$

$2k\pi - \frac{2}{3}\pi < x \leq \frac{\pi}{6} + 2k\pi$

659:

$|\sin^2 3x - \cos^2 3x| - \sin 6x > 0$ $\qquad 3x = t$

$|\sin^2 t - \cos^2 t| - \sin 2t > 0$ $\rightsquigarrow$ Posto tutti con uguale argomento

$|-\cos 2t| - \sin 2t > 0$ $\qquad \cos(2t) = \cos^2 t - \sin^2 t$

$|-\cos y| - \sin y > 0$ $\qquad -\cos(2t) = \sin^2 t - \cos^2 t$

$2t = y$

Caso a: $-\cos y \geq 0$ $\qquad \cos y \leq 0$ $\qquad \frac{\pi}{2} \leq y \leq \frac{3}{2}\pi$

$-\cos y - \sin y > 0$

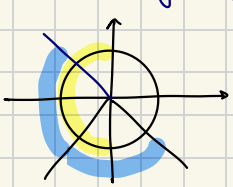
$r\sin(x+\alpha) = a\sin x + b\cos x$

$r = \sqrt{a^2+b^2}$ $\qquad \alpha = \arctg\left(\frac{b}{a}\right)$

$\sin y + \cos y < 0$

$\sqrt{2}\sin\left(y + \frac{\pi}{4}\right) < 0$

$\pi < y + \frac{\pi}{4} < 2\pi$ $\rightsquigarrow$ $\frac{3}{4}\pi < y < \frac{7}{4}\pi$



Sol caso a: $\boxed{\frac{3}{4}\pi < y \leq \frac{3}{2}\pi}$

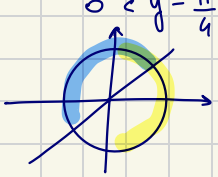
Caso b $\qquad -\cos y \leq 0$ $\rightsquigarrow$ $-\frac{\pi}{2} \leq y \leq \frac{\pi}{2}$

$-\sin y + \cos y > 0$

$\sqrt{2}\sin\left(y - \frac{\pi}{4}\right) > 0$

Warning: Probabilmente con l'angolo aggiunto si deve stare attenti al segno. Potrebbe esserci un errore

$0 < y - \frac{\pi}{4} < \pi$ $\rightsquigarrow$ $\frac{\pi}{4} < y < \frac{5}{4}\pi$



$\boxed{\frac{\pi}{4} < y \leq \frac{\pi}{2}}$

Sol caso b

Soluzione finale: Unione tra i casi

$$2k\pi + \frac{\pi}{4} < \underbrace{y}_{6x} \leq \frac{\pi}{2} + 2k\pi \quad \vee \quad 2k\pi + \frac{3}{4}\pi < y \leq \frac{3}{2}\pi + 2k\pi$$

$$\frac{k\pi}{3} + \frac{\pi}{24} < x \leq \frac{\pi}{12} + \frac{k\pi}{3} \quad \vee \quad \frac{k\pi}{3} + \frac{\pi}{8} < x \leq \frac{\pi}{4} + \frac{k\pi}{3}$$