$\cos 2x - 3\sin x + 1 = \emptyset$

goal: Tranform into $\sin x$-s

from this formula:
$\cos(2\theta) = 1 - 2\sin^2\theta$

$\downarrow$

$1 - 2\sin^2 x - 3\sin x + 1 = \emptyset$

$-2\sin^2 x - 3\sin x + 2 = 0 \quad \Big| \times(-1)$

$2\sin^2 x + 3\sin x - 2 = 0$

$(w = \sin x)$ ↳ as a polynomial

$2w^2 + 3w - 2 = 0$

factor: $2w \ominus 1 \rightarrow w$
$w \oplus 2 \rightarrow 4w$

combine $4w - w = 3w$ ✓

$(2w-1)(w+2)$

verify: $2w^2 + 4w - w - 2$
$= 2w^2 + 3w - 2$ ✓

$(2w-1)(w+2)$
$2w^2 + 4w - w - 2$

restore the equation

$2w^2 + 3w - 2 = (2w-1)(w+2)$

&

$(w = \sin x)$

$\Downarrow$

$(2\sin x - 1)(\sin x + 2) = 0.$

either/or can b zero.

$\boxed{\text{opt. 1}}$

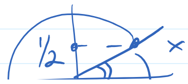
$2\sin x - 1 = \emptyset \Rightarrow \sin x = \frac{1}{2}$

$\boxed{\text{opt 2}}$

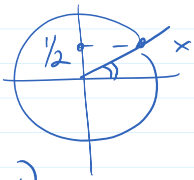
$\sin x + 2 = 0 \Rightarrow \sin x = -2 \leftarrow$ cannot be an option b/c not in the normal sinus range $\equiv [-1, 1]$.

cancel this option.

Solution then

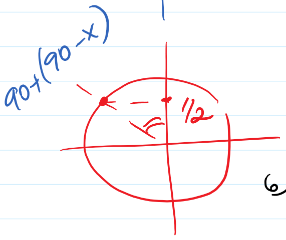


$x = \arcsin(\frac{1}{2}) = 30° = \frac{\pi}{6}$ rads



$x = \arcsin\left(\frac{1}{2}\right) = 30^\circ = \frac{\pi}{6}$ rads

but there is a matching angle in Q2



the matching angle $= 180^\circ - x = 180^\circ - 30^\circ$
$= 150^\circ$

$\pi - \frac{\pi}{6} = \frac{5\pi}{6}$ rads.

Solutions: $\left\{ \frac{\pi}{6}, \frac{5\pi}{6} \right\}$