

TRASFORMAZIONE SINUSOIDI - FASORI

TRASF. DI RIFERIMENTO $a(t) = A \cos(\omega t + \phi) \leftrightarrow \bar{A} = A e^{j\phi}$

$$\begin{aligned} 1. \quad A(t) &= -3 \cos \omega t - 4 \sin \omega t = -3 \cos \omega t - 4 \cos(\omega t - \frac{\pi}{2}) & \left\{ \text{ind} = \cos(\alpha - \frac{\pi}{2}) \right. \\ \bar{A} &= -3 e^{j0} - 4 e^{-j\frac{\pi}{2}} = -3 [\cos 0 + j \sin 0] - 4 [\cos \frac{\pi}{2} - j \sin \frac{\pi}{2}] = \\ &= -3 - 4(-j) = -3 + j4 \end{aligned}$$

$$\begin{aligned} 2. \quad B(t) &= 2 \cos(\omega t - \frac{\pi}{4}) - \sin(\omega t + \frac{\pi}{6}) = 2 \cos(\omega t - \frac{\pi}{4}) - \cos(\omega t + \frac{\pi}{6} - \frac{\pi}{2}) = \\ &= 2 \cos(\omega t - \frac{\pi}{4}) - \cos(\omega t - \frac{2}{3}\pi) & \left\{ -\frac{2}{3}\pi \text{ rad} = -120^\circ \right\} \end{aligned}$$

$$\begin{aligned} \bar{B} &= 2 e^{-j45^\circ} - 1 e^{-j120^\circ} = 2 [\cos 45^\circ - j \sin 45^\circ] - [\cos 120^\circ - j \sin 120^\circ] \\ &= 2 \left[\frac{\sqrt{2}}{2} - j \frac{\sqrt{2}}{2} \right] - \left[-\frac{1}{2} - j \frac{\sqrt{3}}{2} \right] = \\ &= \left(\sqrt{2} + \frac{1}{2} \right) + j \left[-\sqrt{2} + \frac{\sqrt{3}}{2} \right] = 1,914 + j(-0,548) = 1,99 e^{-j15,98^\circ} \end{aligned}$$

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$$3. \quad \bar{A} = (1 + \sqrt{2}) - j(2 - \sqrt{3}) = 2,414 - j0,268 = 2,429 e^{-j6,33^\circ}$$

$$\begin{aligned} a(t) &= 2,429 \cos(\omega t - 6,33^\circ) = \\ &= 2,414 \cos \omega t + 0,268 \sin \omega t \end{aligned}$$

$$4. \quad \bar{B} = (1 - \sqrt{2}) - j(2 - \sqrt{3}) = -0,414 - j0,268 = 0,493 e^{-j147,10^\circ}$$

$$\begin{aligned} b(t) &= 0,493 \cos(\omega t - 147,10^\circ) = \\ &= -0,414 \cos \omega t + 0,268 \sin \omega t \end{aligned}$$

$$-2 \cos \omega t = -2 e^{j0} = 2 e^{-j180^\circ}$$

$$-0,414 \cos \omega t = 0,414 (\omega t - 180^\circ)$$