

PROBLEM:

Four *different* sinusoidal signals are defined by the following representations:

(a) $x_a(t) = 2\sqrt{2} \cos(20\pi t - \pi/4)$

(b) $x_b(t) = \cos(20\pi t - \pi/4)$

(c) $x_c(t) = e^{-j\pi/4} e^{j20\pi t} + e^{j\pi/4} e^{-j20\pi t}$

(d) $x_d(t) = \Re \left\{ \sqrt{2}(1 + j)e^{j20\pi t} \right\}$

For each of the following signals, pick one of the representations above that defines the exactly same signal.

Write your answer ((a), (b), (c) or (d)) in the box next to each signal.

ANS = $2 \cos(20\pi t - \pi/4)$

ANS = $2 \cos(20\pi t) + 2 \sin(20\pi t)$

ANS = $e^{j\pi/4} e^{j20\pi t} + e^{-j\pi/4} e^{-j20\pi t}$

ANS = $\sqrt{2}e^{-j\pi/4} e^{j20\pi t} + \sqrt{2}e^{j\pi/4} e^{-j20\pi t}$

ANS = $\Re \left\{ 2e^{j\pi/4} e^{j20\pi t} \right\}$

ANS = $\Re \left\{ 2e^{-j\pi/4} e^{j20\pi t} \right\}$