

**PROBLEM:**

For each of the following signals, pick one of the representations below that defines *exactly* the same signal. Write your answer  $x_1(t)$ ,  $x_2(t)$ ,  $x_3(t)$ ,  $x_4(t)$ , or  $x_5(t)$ , in the box next to each signal. In addition, write the complex amplitude ( $X_k$ ) of the sinusoid for each case in the space provided.

ANS =   $3 \cos(100\pi t + \pi/4)$

$X_k =$

ANS =   $3 \cos(100\pi t + 3\pi/4)$

$X_k =$

ANS =   $\frac{3}{2}e^{j3\pi/4}e^{j100\pi t} + \frac{3}{2}e^{-j3\pi/4}e^{-j100\pi t}$

$X_k =$

ANS =   $3 \cos(100\pi t - 11\pi/4)$

$X_k =$

ANS =   $\Re \left\{ \frac{3}{2}(\sqrt{2} - j\sqrt{2})e^{j100\pi t} \right\}$

$X_k =$

**POSSIBLE ANSWERS: Some of these answers can be used more than once.**

If one answer is used twice, another one won't be used at all.

1.  $x_1(t) = 3 \cos(100\pi t + 11\pi/4)$

2.  $x_2(t) = \Re \left\{ \frac{3}{2}e^{-j\pi/4}e^{j100\pi t} \right\}$

3.  $x_3(t) = 3 \cos(100\pi t - \pi/4)$

4.  $x_4(t) = \Re \left\{ \frac{3}{2}(\sqrt{2} + j\sqrt{2})e^{j100\pi t} \right\}$

5.  $x_5(t) = \Re \left\{ 3e^{-j3\pi/4}e^{j100\pi t} \right\}$