5) How are the graphs from part 2) related to the graph in part 3)? Are the values for period and amplitude the same or different? Why do you think we see these results? Please write out your explanation using complete sentences.

1/5

Graph part 2 and part 3 are similar. The part 2 graph is more of a reference of what graph part 3 should look like

Response to this?

Part II:

6) Prove that the following is an identity (A is a positive constant) by filling in the blanks below.

2/2

$$A\sin\phi\sin(\omega t)+A\cos\phi\cos(\omega t)=A\cos(\omega t-\phi)$$

$A\sin\phi\sin(\omega t)+A\cos\phi\cos(\omega t)$	$=A(\sin\phi\sin(\omega t)+\cos\phi\cos(\omega t))$	Factor out A
	$=A(\cos\phi\cos(\omega t)+\sin\phi\sin(\omega t))$	Commutative Property of Addition
	$=A[\cos(\omega t)\cos\phi+\sin(\omega t)\sin\phi]$	Commutative Property of Multiplication
	$=A\cos(\omega t-\phi)$	Difference identity for cosine

Part III:

Rewrite an expression of the form

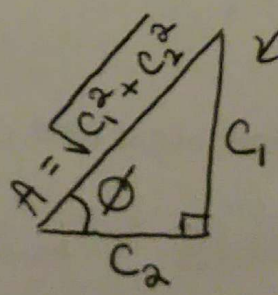
$c_1\sin(\omega t)+c_2\cos(\omega t)=A\sin\phi\sin(\omega t)+A\cos\phi\cos(\omega t)$ in terms of a cosine function:

$A\cos(\omega t-\phi)$. Use the following **definitions** and your result from part II:

① $c_1=A\sin\phi\Rightarrow\sin\phi=\frac{c_1}{A}$

② $c_2=A\cos\phi\Rightarrow\cos\phi=\frac{c_2}{A}$

$\tan\phi=\frac{c_1}{c_2}$



"Visual Reminder"

Please note that c_1, c_2 may possibly be negative.

$A=\sqrt{c_1^2+c_2^2}$

A, is the amplitude of the cosine function and ϕ, "phi", is called the phase angle and is measured in radians.