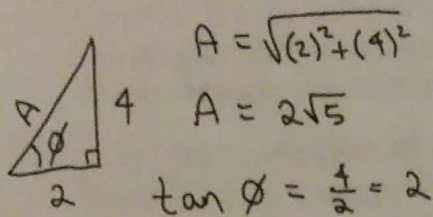


Example: Write $4 \sin 3t + 2 \cos 3t$ in terms of a cosine function.



$\phi = \tan^{-1}(2) \approx 1.12$
 ↑
 ! Radian mode !

$$4 \sin 3t + 2 \cos 3t \approx \boxed{2\sqrt{5} \cos(3t - 1.12)}$$

$$\approx 2\sqrt{5} \cos[3(t - 0.37)]$$

7) Rewrite your function from part 1) in terms of a cosine function: $A \cos(\omega t - \phi)$. Show your work.

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$$2 \sin(2t) + 3 \cos(2t)$$

$$A \cos(\omega t - \phi)$$

$$\sqrt{(2)^2 + (3)^2}$$

$$\sqrt{13} \quad \checkmark$$

$$\tan \phi = \frac{2}{3}$$

$$\phi = \tan^{-1}\left(\frac{2}{3}\right) = 0.59 \quad \checkmark$$

$$\boxed{\sqrt{13} \cos(2t - 0.59)} \quad \checkmark$$

8) Compare your function from part 4) and part 7). What do you observe? Write a one or two sentence explanation.

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Part 7 not expanded but it derive so is close to/equivalent to part 4. \checkmark