

1 Section 6.4 Functions of the form $f(x) = a \sin x + b \cos x$

$a \sin x + b \cos x = k \sin(x + \alpha)$ where $k = \sqrt{a^2 + b^2}$ and α is the angle for which $\sin \alpha = \frac{b}{k}$ and $\cos \alpha = \frac{a}{k}$.

Example 1 Rewrite $-\sin x - \cos x$ in the form $k \sin(x + \alpha)$.

Example 2 Graph $f(x) = 2\sqrt{3} \sin x - 2 \cos x$.

Example 3 Find the amplitude, Phase shift, and period of the following: $y = -\sin 2x + \cos 2x$.