In this class, we discuss 4 different forms of the solutions of the equation of motion for a simple harmonic oscillator:

$$\text{A Form: } x(t) = A\cos(\omega t + \phi)$$

$$\text{B Form: } x(t) = B_1\cos(\omega t) + B_2\sin(\omega t)$$

$$\text{C Form: } x(t) = Ce^{i\omega t} + C^*e^{-i\omega t}$$

$$\text{D Form: } x(t) = Re[De^{i\omega t}]$$

Some useful relations:

$$\cos(\alpha + \beta) = \cos\alpha\cos\beta - \sin\alpha\sin\beta$$

$$e^{i\theta} = \cos\theta + i\sin\theta$$

1. Relate B_1 & B_2 to A & ϕ

2. Relate C to B_1 & B_2

3. Relate D to A & ϕ