

HARMONIC FUNCTIONS DRILL

last update October 6, 2000

All quantities appearing in parentheses are real numbers.

1. Find expressions for a and b in terms of A and B :

$$A \sin(\omega t + B) = a \cos(\omega t + b) .$$

2. Find expressions for a and b in terms of A and B :

$$(A) \sin(\omega t + B) = (a) \sin(\omega t) + (b) \cos(\omega t) .$$

3. Find expressions for a and b in terms of A and B :

$$(A) \cos(\omega t + B) = (a) \sin(\omega t) + (b) \cos(\omega t) .$$

4. Find expressions for a and b in terms of A , B , C , and D :

$$(A) \sin(\omega t + B) + (C) \sin(\omega t + D) = (a) \sin(\omega t + b) .$$

5. Find expressions for a and b in terms of A , B , C , and D :

$$(A) \cos(\omega t + B) + (C) \cos(\omega t + D) = (a) \cos(\omega t + b) .$$

6. Find expressions for a , b , c , and d in terms of A and B :

$$(A) \sin(\omega t) + (B) \cos(\omega t) = (a) \sin(\omega t + b) = (c) \cos(\omega t + d) .$$

7. Find an expression for a in terms of A and B :

$$(A) \exp i(\omega t + B) = a \exp i(\omega t) .$$

8. Find expressions for a and b in terms of A and B :

$$(A) \exp i(\omega t) + (B) \exp -i(\omega t) = a \sin(\omega t) + b \cos(\omega t) .$$

9. Find expressions for a and b in terms of A and B :

$$(A) \sin(\omega t) + (B) \cos(\omega t) = a \exp i(\omega t) + b \exp -i(\omega t) .$$

10. Find expressions for a and b in terms of A and B :

$$A \sin(\omega t) + B \cos(\omega t) = a \exp i(\omega t) + b \exp -i(\omega t) .$$

11. Find expressions for a and b in terms of A and B :

$$(A) \cos(\omega t + B) = a \exp i(\omega t) + b \exp -i(\omega t) .$$