Advanced High School Trigonometry

Mathematics · Practice Test · 25 Questions

1. What is the exact value of sin(15°) using the angle subtraction formula?

A) (?6 - ?2)/4
B) (?6 + ?2)/4
C) (?3 - 1)/2
D) (?2 - ?3)/4

2. For the function f(x) = 3cos(2x - ?) + 1, what is the correct period?

A) ?
B) 2?
C) 4?
D) ?/2

3. Which expression is equivalent to (1 - cos(2?)) / sin(2?)?

A) tan(?)
B) cot(?)
C) sin(?)
D) sec(?)

4. What is the domain of the function f(x) = sec(x)?

A) x != n?, n ? Z
B) x != (2n+1)?/2, n ? Z
C) x != 2n?, n ? Z
D) All real numbers

5. If tan(?) = 3/4 and ? is in the third quadrant, what is the value of cos(?)?

A) 4/5
B) 3/5
C) -4/5
D) -3/5

6. Which identity represents the double-angle formula for cos(2?) in terms of sin only?

A) 1 - 2sin²(?)
B) 2sin²(?) - 1
C) 1 + 2sin²(?)
D) cos²(?) - sin²(?)

7. What is the general solution for the equation sin(x) = 1/2?

A) x = n? + (-1)^n(?/6)
B) x = 2n? ± ?/6
C) x = n? + ?/6
D) x = n? - ?/6

8. The range of the inverse function f(x) = arccos(x) is defined as:

A) (-?/2, ?/2)
B) [0, ?]
C) [-?/2, ?/2]
D) (0, ?)

9. Using the harmonic addition theorem, express ?3sin(x) + cos(x) in the form Rsin(x + ?).

A) 2sin(x + ?/6)
B) 2sin(x + ?/3)
C) ?3sin(x + ?/6)
D) 2sin(x - ?/6)

10. What is the derivative of f(x) = tan(x)?

A) sec(x)
B) $\sec^2(x)$
C) $\csc^2(x)$
D) $-\sec^2(x)$

11. For a triangle with sides a, b, c and angle C opposite to side c, what is the Cosine Rule?

A) $c^2 = a^2 + b^2 - 2ab \cos(C)$
B) $c^2 = a^2 + b^2 + 2ab \cos(C)$
C) $a^2 = b^2 + c^2 - 2bc \cos(A)$
D) $c^2 = a^2 + b^2 - ab \cos(C)$

12. Which value is equal to sin(75°)cos(15°) + cos(75°)sin(15°)?

A) 0
B) 1
C) 0.5
D) ?3/2

13. What is the period of the function y = tan(bx)?

A) b/?
B) ?/b
C) 2?/b
D) ?b

14. If sec²(?) - tan²(?) = k, what is the value of k?

A) 0
B) 1
C) sec(?)
D) tan(?)

15. The value of sin(arccos(x)) for |x| <= 1 is:

A) ?(1 - x²)
B) 1 - x²
C) x
D) 1/?(1 - x²)

16. Which of the following is an odd function?

A) f(x) = cos(x)
B) f(x) = sec(x)
C) f(x) = sin(x)
D) f(x) = |sin(x)|

17. If 0 <= ? < 2?, how many solutions exist for sin(2?) = 1/2?

A) 1
B) 2
C) 4
D) 8

18. The identity cos(A + B) + cos(A - B) is equal to:

A) 2cos(A)cos(B)
B) 2sin(A)sin(B)
C) 2cos(A)sin(B)
D) 2sin(A)cos(B)

19. What is the limit of sin(x)/x as x approaches 0?

A) 0
B) 1
C) ?
D) undefined

20. If cot(?) = -?3 and ?/2 < ? < ?, what is the value of ??

A) 2?/3
B) 5?/6
C) 7?/6
D) 11?/6

21. Which expression is equivalent to csc²(?) - 1?

A) sec²(?)
B) tan²(?)
C) cot²(?)
D) sin²(?)

22. What is the exact value of cos(11?/12)?

A) -(?6 + ?2)/4
B) (?6 - ?2)/4
C) -(?6 - ?2)/4
D) (?6 + ?2)/4

23. The function y = sin(x) is increasing on which interval within [0, 2?]?

A) (0, ?)
B) (0, ?/2) and (3?/2, 2?)
C) (?/2, 3?/2)
D) (0, 2?)

24. Simplify sin(? + 3?/2).

A) cos(?)
B) -cos(?)
C) sin(?)
D) -sin(?)

25. What is the amplitude of the function y = -4sin(x) + 2?

A) -4
B) 4
C) 2
D) 6