

Trigonometric Principles and Applications

Trigonometry · Practice Test · 20 Questions

1. In the unit circle, what is the value of the cosine of an angle theta when the terminal side lies on the positive y-axis?

- A) 0
- B) 1
- C) -1
- D) Undefined

2. Which trigonometric function represents the ratio of the opposite side to the hypotenuse in a right-angled triangle?

- A) Cosine
- B) Tangent
- C) Sine
- D) Secant

3. What is the period of the standard sine function $f(x) = \sin(x)$?

- A) π
- B) 2π
- C) $\pi/2$
- D) 4π

4. In the context of the Law of Cosines, what does the formula $c^2 = a^2 + b^2 - 2ab\cos(C)$ allow one to calculate?

- A) The area of a triangle
- B) The angle of a right triangle
- C) The length of a side of any triangle
- D) The volume of a tetrahedron

5. What is the relationship between the tangent function and the sine and cosine functions?

- A) $\tan(x) = \cos(x)/\sin(x)$
- B) $\tan(x) = \sin(x)*\cos(x)$
- C) $\tan(x) = \sin(x)/\cos(x)$
- D) $\tan(x) = 1/\sin(x)$

6. The Pythagorean identity states that $\sin^2(x) + \cos^2(x)$ is equal to what value?

- A) 0
- B) 1
- C) 2
- D) $\tan(x)$

7. Which trigonometric function is defined as the reciprocal of the cosine function?

- A) Cosecant
- B) Secant
- C) Cotangent
- D) Sine

8. In navigation and geodesy, what is the value of the tangent of 45 degrees?

- A) 0
- B) 0.5
- C) 1
- D) $\sqrt{3}$

9. According to Euler's formula, e^{ix} is equal to which trigonometric expression?

- A) $\sin(x) + i\cos(x)$
- B) $\cos(x) + i\sin(x)$
- C) $\cos(x) - i\sin(x)$
- D) $\sin(x) - i\cos(x)$

10. Which quadrant of the Cartesian plane is the cosine function positive while the sine function is negative?

- A) Quadrant I
- B) Quadrant II
- C) Quadrant III
- D) Quadrant IV

11. What is the value of $\sin(\pi/6)$ in degrees?

- A) 0.5
- B) 0.707
- C) 0.866
- D) 1

12. In a right-angled triangle, the sum of the two non-right angles is always equal to how many degrees?

- A) 45
- B) 90
- C) 180
- D) 360

13. What does the inverse sine function, $\arcsin(x)$, return when the input is 1?

- A) 0
- B) $\pi/4$
- C) $\pi/2$
- D) π

14. The conversion of polar coordinates (r, θ) to Cartesian coordinates (x, y) uses which formula for x ?

- A) $x = r \cdot \sin(\theta)$
- B) $x = r \cdot \cos(\theta)$
- C) $x = r \cdot \tan(\theta)$
- D) $x = r / \cos(\theta)$

15. Which of these functions is an odd function, meaning $f(-x) = -f(x)$?

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

16. What is the value of the cotangent of 90 degrees?

- A) 0
- B) 1
- C) -1
- D) Undefined

17. How many radians are equivalent to one full rotation around a circle (360 degrees)?

- A) π
- B) $2 \cdot \pi$
- C) $\pi/2$
- D) $3 \cdot \pi$

18. In terms of signal processing, what are sine and cosine waves used to describe?

- A) Direct current
- B) Harmonic oscillation
- C) Static friction
- D) Thermal expansion

19. Which trigonometric identity describes the relationship between the secant and tangent functions?

- A) $1 + \tan^2(x) = \sec^2(x)$
- B) $1 + \sec^2(x) = \tan^2(x)$
- C) $\tan^2(x) - \sec^2(x) = 1$
- D) $\sin^2(x) + \sec^2(x) = 1$

20. What is the slope of a line that makes a 60-degree angle with the positive x-axis?

- A) 1
- B) $\sqrt{3}$
- C) $1/\sqrt{3}$
- D) 0.5