Inverse Trigonometric Functions and Core Identities

Inverse trig functions, core identities, and the symbolic fluency needed for later analytic trigonometry.

Name _____ Date _____

32 main | 2-up grid | 2 pages

Completion Reward

Shown here as a small pack artifact, not a preview destination.

1. Which interval is the principal range of y = arcsin(x)?

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

2. Which interval is the principal range of y = arccos(x)?

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

3. Which interval is the principal range of y = arctan(x)?

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

4. Which statement is true?

A. cos(-x) = cos(x)
B. cos(-x) = -cos(x)
C. sin(-x) = sin(x)
D. tan(-x) = tan(x)

5. Which statement is true?

A. sin(-x) = -sin(x)
B. sin(-x) = sin(x)
C. sin(x) = cos(x)
D. sin(x) = 1 / cos(x)

6. Which statement is true?

A. tan(-x) = tan(x)
B. tan(-x) = -tan(x)
C. tan(x) = sec(x)
D. tan(x) = 1 / sin(x)

7. Which identity is always true?

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

8. Which identity is always true?

A. 1 + sec^2(x) = tan^2(x)
B. 1 + tan^2(x) = sec^2(x)
C. tan^2(x) + sec^2(x) = 1
D. 1 - tan^2(x) = sec^2(x)

9. Which identity is always true?

A. 1 + csc^2(x) = cot^2(x)
B. cot^2(x) + csc^2(x) = 1
C. 1 + cot^2(x) = csc^2(x)
D. 1 - cot^2(x) = csc^2(x)

10. What does arccos(1 / 2) ask for?

A. The reciprocal of cos(1 / 2)
B. The angle whose sine is 1 / 2
C. The value of 1 / cos(2)
D. The angle whose cosine is 1 / 2

11. Which reciprocal relationship is correct?

A. sec(x) = 1 / sin(x)
B. sec(x) = cos(x) / sin(x)
C. sec(x) = 1 / cos(x)
D. sec(x) = sin(x) / cos(x)

12. If sin(theta) = 1 / 3, what is csc(theta)?

A. 1 / 3
B. -3
C. 3
D. 2 / 3

13. To simplify 1 - sin^2(x), what is the best next step?

A. Replace it with tan^2(x)
B. Replace it with sec^2(x)
C. Replace it with cos^2(x)
D. Replace it with sin(x)

14. What is the best first step to find cos(arcsin(3 / 5))?

A. Draw a right triangle with adjacent 3 and hypotenuse 5
B. Treat cos(arcsin(3 / 5)) as 3 / 5 immediately
C. Draw a right triangle with opposite 3 and hypotenuse 5
D. Use a double-angle identity

15. A student says arccos(-1 / 2) = 4pi / 3. What is the mistake?

A. The value should be negative
B. arccos can only output acute angles
C. 4pi / 3 is outside the principal range of arccos
D. arccos(-1 / 2) does not exist

16. Find arcsin(1 / 2). Answer as an exact value.

17. Find arcsin(-sqrt(2) / 2). Answer as an exact value.

18. Find arccos(0). Answer as an exact value.

19. Find arccos(-1). Answer as an exact value.

20. Find arctan(1). Answer as an exact value.

21. Find arctan(sqrt(3)). Answer as an exact value.

22. Find cos(arcsin(3 / 5)). Answer as an exact value.

23. Find sin(arccos(5 / 13)). Answer as an exact value.

24. Find tan(arcsin(3 / 5)). Answer as an exact value.

25. Find sec(arccos(1 / 2)). Answer with a number.

26. Find csc(arcsin(-1 / 2)). Answer with a number.

27. Find cos(arctan(3 / 4)). Answer as an exact value.

28. Rewrite 1 - sin^2(x) using a Pythagorean identity. Answer as an expression.

29. Rewrite sec^2(x) - 1 using a Pythagorean identity. Answer as an expression.

30. Rewrite csc^2(x) - 1 using a Pythagorean identity. Answer as an expression.

31. Rewrite sin(-x) using symmetry. Answer as an expression.

32. If sin(theta) = 3 / 5 and theta is acute, which value of cos(theta) is correct?

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