

INVERSE TRIGONOMETRIC FUNCTIONS AND TRIGONOMETRIC EQUATIONS

1. The inverse sine function is defined is by

- $y = \sin^{-1} x$
- $\frac{\sin^{-1} x}{4x}$
- $\sin^7 x$
- $\cos^2 x$
- None of these

Answer: a)

2. $\text{Cos}^{-1}A + \text{Cos}^{-1}B =$

- $\text{Cos}^{-1}\{AB + \sqrt{1-A^2}\sqrt{1-B^2}\}$
- $\text{Sin}^{-1}\{A\sqrt{1-B^2}B\sqrt{1-A^2}\}$
- $\text{Cos}^{-1}\{2A-1\}$
- $\text{Sin}^{-1}\{A + \sqrt{1-B^2}B\sqrt{1-A^2}\}$
- $\text{Cos}^{-1}\{AB - \sqrt{1-A^2}\sqrt{1-B^2}\}$

Answer: e)

3. $\text{Sin}^{-1}A + \text{Sin}^{-1}B =$

- $\text{Cos}^{-1}\{AB + \sqrt{1-A^2}\sqrt{1-B^2}\}$
- $\text{Sin}^{-1}\{A\sqrt{1-B^2}\sqrt{1-A^2}\}$
- $\text{Cos}^{-1}\{2A^2-1\}$
- $\text{Sin}^{-1}\{A - \sqrt{1-B^2}B\sqrt{1-A^2}\}$
- $\text{Cos}^{-1}\{AB - \sqrt{1-A^2}\sqrt{1-B^2}\}$

Answer: b)

4. $\text{Cos}^{-1}A - \text{Cos}^{-1}B =$

- $\text{Cos}^{-1}\{AB + \sqrt{1-A^2}\sqrt{1-B^2}\}$
- $\text{Sin}^{-1}\{A\sqrt{1-B^2} + B\sqrt{1-A^2}\}$
- $\text{Cos}^{-1}\{2A^2-1\}$
- $\text{Sin}^{-1}\{A\sqrt{1-B^2} - B\sqrt{1-A^2}\}$
- $\text{Cos}^{-1}\{AB - \sqrt{1-A^2}\sqrt{1-B^2}\}$

Answer: a)

5. $\text{Sin}^{-1}A - \text{Sin}^{-1}B =$

- $\text{Cos}^{-1}\{AB + \sqrt{1-A^2}\sqrt{1-B^2}\}$
- $\text{Sin}^{-1}\{A\sqrt{1-B^2} + B\sqrt{1-A^2}\}$
- $\text{Cos}^{-1}\{2A^2-1\}$
- $\text{Sin}^{-1}\{A\sqrt{1-B^2} - B\sqrt{1-A^2}\}$
- $\text{Cos}^{-1}\{AB - \sqrt{1-A^2}\sqrt{1-B^2}\}$

Answer: d)

6. $\text{Sin}^{-1}\{2A\sqrt{1-A^2}\} =$

- $\text{Sin}^{-1}\{2A\sqrt{1-A^2}\} =$
- $\text{Sin}^{-1}\{A\sqrt{A^2-2}\}$
- $\text{Cos}^{-1}\{2A^2-1\}$
- $\text{Cos}^{-1}\{A^2-2\}$
- $2\text{Sin}^{-1}A$

Answer: e)

7. $2\text{Cos}^{-1}A$

- $\text{Sin}^{-1}\{2A^2-1\}$
- $\text{Sin}^{-1}\{2A^2-2\}$
- $\text{Con}^{-1}\{2A^2-1\}$
- $\text{Cos}^{-1}\{A^2-2\}$
- $\text{Cos}^{-1}\{AB\sqrt{1-A^2}\sqrt{1-B^2}\}$

Answer: c)

8. $\text{Tan}^{-1}\left(\frac{2A}{1-A^2}\right) =$

- $\text{Tan}^{-1}\left(\frac{A}{2}\right)$
- $\text{Tan}^{-1}\left(\frac{2}{A}\right)$
- $\text{Tan}^{-1}A$
- $\text{Tan}^{-1}2A$
- $2\text{Tan}^{-1}A$

Answer: e)

9. $\text{Tan}^{-1}A + \text{Tan}^{-1}B + \text{Tan}^{-1}C =$

- $\text{Tan}^{-1}\left(\frac{A-B}{1+AB}\right)$
- $\text{Tan}^{-1}\left(\frac{A-B}{1-AB}\right)$
- $\text{Tan}^{-1}\left(\frac{1-AB-BC-CA}{A+B+C-ABC}\right)$

d) $Tan^{-1}\left(\frac{A+B+c-ABC}{1-Ab-BC-CA}\right)$

e) $Tan^{-1}(A+B+C)$

Answer: d)

10. $Tan^{-1}A - Tan^{-1}B =$

a) $Tan^{-1}\left(\frac{A-B}{1+AB}\right)$

b) $Tan^{-1}\left(\frac{A+B}{1-AB}\right)$

c) $Tan^{-1}\left(\frac{A+AB}{A-B}\right)$

d) $Tan^{-1}\left(\frac{1-AB}{A+B}\right)$

e) $Cos^{-1}\{AB - \sqrt{1-A^2}\sqrt{1-B^2}\}$

Answer: a)

11. $Tan^{-1}A + Tan^{-1}B =$

a) $Tan^{-1}\left(\frac{A-B}{1+AB}\right)$

b) $Tan^{-1}\left(\frac{A+B}{1-AB}\right)$

c) $Tan^{-1}\left(\frac{1+A^2B^2}{A-B}\right)$

d) $Tan^{-1}\left(\frac{1-AB}{A+B}\right)$

e) $Cos^{-1}\{AB - \sqrt{1-A^2}\sqrt{1-B^2}\}$

Answer: d)

12. $Tan^{-1}\left(\frac{x-1}{x-2}\right) + Tan^{-1}\left(\frac{x+1}{x+2}\right) =$

a) $Tan^{-1}\left(\frac{2x^2-3}{2x^2-4}\right)$

b) $Tan^{-1}\left(\frac{2x^2-4}{2x^2-3}\right)$

c) $Tan^{-1}\left(\frac{2x^2+3}{2x^2+4}\right)$

d) $Tan^{-1}\left(\frac{2x^2+4}{2x^2+3}\right)$

e) None of these

Answer: b)

13. $Tan^2A + Tan^{-1}\left(\frac{1-A}{1+A}\right) =$

a) $\frac{1}{6}\pi$

b) $\frac{1}{4}\pi$

c) $\frac{1}{2}\pi$

d) π

e) 2π

Answer: b)

14. $Tan^{-1}\frac{1}{7} - Tan^{-1}\frac{1}{13} =$

a) $Tan^{-1}\frac{2}{9}$

b) $Tan^{-1}\frac{9}{2}$

c) $Tan^{-1}\frac{3}{46}$

d) $Tan^{-1}7$

e) $Tan^{-1}13$

Answer: c)

15. $Tan^{-1}\frac{1}{2} + Tan^{-1}\frac{1}{3} =$

a) $\frac{\pi}{6}$

b) $\frac{\pi}{4}$

c) $\frac{\pi}{2}$

d) π

e) 2π

Answer: c)

16. $Tan^{-1}\frac{1}{3}A + Tan^{-1}\frac{1}{5} + Tan^{-1}\frac{1}{7} + Tan^{-1}\frac{1}{8} =$

a) $\frac{1}{6}\pi$

b) $\frac{1}{4}\pi$

c) $\frac{1}{2}\pi$

d) π

e) 2π

Answer: b)

$$17. \tan^{-1} \frac{1}{7} + \tan^{-1} \frac{1}{13} =$$

- a) $\tan^{-1} \frac{2}{9}$
- b) $\tan^{-1} \frac{9}{2}$
- c) $\tan^{-1} \frac{3}{46}$
- d) $\tan^{-1} 7$
- e) $\tan^{-1} 13$

Answer: a)

$$18. \tan^{-1} \left(\frac{3A - A^3}{1 - 3A^2} \right) =$$

- a) $2 \tan^{-1} A$
- b) $\tan^{-1} 2A$
- c) $3 \tan^{-1} A$
- d) $\tan^{-1} 3A$
- e) $\tan^{-1} A$

Answer: c)

$$19. \sin^{-1} \left(\frac{-1}{2} \right) = \dots\dots\dots$$

- a) $\frac{\pi}{4}$
- b) $\frac{-\pi}{6}$
- c) $\frac{2\pi}{3}$
- d) -180°
- e) None of these

Answer: b)

$$20. y = \operatorname{cosec} x \text{ where } \frac{-\pi}{2} < y < \frac{\pi}{2} \text{ and } x \neq 0 \text{ is called}$$

the

- a) simple sine
- b) principal cosecant
- c) odd
- d) even
- e) none of these

Answer: b)

$$21. \tan^{-1} \frac{1}{x} = ?$$

- a) $\sec^{-1} \frac{1}{x}$
- b) $\frac{\sin^{-1} x}{\cos^{-1} x}$
- c) $\cot^{-1} x$
- d) $\sec^{-1}(-x)$
- e) None of these

Answer: c)

$$22. \operatorname{cosec}^{-1} x = ?$$

- a) $\sec^{-1} \left(\frac{1}{x} \right)$
- b) $\cos^{-1} \left(\frac{1}{x} \right)$
- c) $\frac{1}{\cos^{-1} x}$
- d) $\sin^{-1} x$
- e) None of these

Answer: a)

$$23. \sin^{-1} x = ?$$

- a) $\sin^{-1}(-x)$
- b) $\frac{1}{\tan^{-1}(x)}$
- c) $\sin^{-1} \frac{1}{x}$
- d) $\frac{\pi}{2} - \cos^{-1} x$
- e) None of these

Answer: d)

$$24. \cot^{-1} \left(\frac{1}{x} \right)$$

- a) $\sin^{-1} \left(\frac{1}{x} \right)$
- b) $\cos^{-1} \left(\frac{1}{x} \right)$
- c) $\tan^{-1} \left(\frac{1}{x} \right)$
- d) None of these

Answer: c)

$$25. \sec^{-1} x = ?$$

- a) $\cos^{-1} \left(\frac{1}{x} \right)$

- b) $\sin^{-1} \frac{1}{x}$
 c) $\cos^{-1}(-x)$
 d) None of these

Answer: a)

26. $\cos(\sin^{-1} x) = ?$

- a) $\frac{x}{\sqrt{1+x^2}}$
 b) $\pm \sqrt{1+x^2}$
 c) $\frac{1}{1+x^2}$
 d) $\frac{x}{\sqrt{1-x^2}}$
 e) None of these

Answer: d)

27. $\sin^{-1} x + \cos^{-1} x = ?$

- a) 0
 b) -1
 c) $\frac{\pi}{2}$
 d) None of these

Answer: c)

28. $\tan(\pi + \tan^{-1} x) = ?$

- a) -x
 b) X
 c) Tan x
 d) $\sqrt{1+x^2}$

Answer: b)

29. $\tan^{-1} \left(\frac{\sqrt{1-x^2}}{x} \right)$

- a) $\text{Con}^{-1} x$
 b) $\sin^{-1} x$
 c) $\tan^{-1} x$
 d) $\cot^{-1} x$
 e) None of these

Answer: a)

30. $\tan^{-1} x - \tan^{-1} y = \underline{\hspace{2cm}}$

- a) $\tan^{-1} \left(\frac{x-y}{1+xy} \right)$

b) $\tan^{-1} \left(\frac{x+y}{1+xy} \right)$

c) $\tan^{-1} \left(\frac{x+y}{1-xy} \right)$

d) $\tan^{-1} \left(\frac{x-y}{1-xy} \right)$

- e) None of these

Answer: a)

31. $\cos^{-1} x + \cos^{-1} y = \underline{\hspace{2cm}}$

a) $\text{Cos}^{-1} \left(xy - \sqrt{1+x^2} \sqrt{1-y^2} \right)$

b) $\text{Cos}^{-1} \left(xy - \sqrt{1-x^2} \sqrt{1-y^2} \right)$

c) $\text{Cos}^{-1} \left(xy + \sqrt{1+x^2} \sqrt{1-y^2} \right)$

d) $\text{Cos}^{-1} \left(xy + \sqrt{1+x^2} \sqrt{1+y^2} \right)$

- e) None of these

Answer: b)

32. $\tan(\sin^{-1} x) = ?$

a) $\sqrt{1+x^2}$

b) $\frac{1}{1+x^2}$

c) $\frac{x}{\sqrt{1-x^2}}$

- d) None of these

Answer: c)

33. $\sin^{-1} x + \sin^{-1} y = ?$

a) $\sin^{-1} \left(x\sqrt{1-x^2} - y\sqrt{1-y^2} \right)$

b) $\sin^{-1} \left(x\sqrt{1-y^2} - y\sqrt{1-x^2} \right)$

c) $\sin^{-1} \left(x\sqrt{1-y^2} + y\sqrt{1-x^2} \right)$

d) $\sin^{-1} \left(x\sqrt{1-y^2} - y\sqrt{1-x^2} \right)$

- e) None of these

Answer: d)