RK VISION ACADEMY

NEET | IIT – JEE | FOUNDATION

CBSE PRACTICE PAPER(2024)

(Mathematics)

Grade : XII **Marks: 40 marks**

Chapter: INVERSE TRIGNOMETRY Set-1 **Time: 90 minutes**

SECTION A

(This section comprises of Multiple-choice questions (MCQ) of 1 mark each.)

1. $\sec^{-1}[\sec(-30^o)] =$

(a) -60^o (b) -30^o (c) 30^o (d) 150^o

2. $\tan^{-1}\dfrac{1}{\sqrt{x^2-1}} =$

(a) $\dfrac{\pi}{2}+\operatorname{cosec}^{-1}x$ (b) $\dfrac{\pi}{2}+\sec^{-1}x$ (c) $\operatorname{cosec}^{-1}x$ (d) $\sec^{-1}x$

3. The principal value of $\sin^{-1}\left(-\dfrac{1}{2}\right)$ is

(a) $\dfrac{\pi}{3}$ (b) $\dfrac{\pi}{6}$ (c) $-\dfrac{\pi}{3}$ (d) $-\dfrac{\pi}{6}$

4. $\sec^2(\tan^{-1}2)+\operatorname{cosec}^2(\cot^{-1}3) =$

(a) 5 (b) 13 (c) 15 (d) 6

5. $\sin^{-1}\left[x\sqrt{1-x}-\sqrt{x}\sqrt{1-x^2}\right] =$

(a) $\sin^{-1}x+\sin^{-1}\sqrt{x}$ (b) $\sin^{-1}x-\sin^{-1}\sqrt{x}$ (c) $\sin^{-1}\sqrt{x}-\sin^{-1}x$ (d)None of these

6. If $\tan^{-1}\dfrac{1-x}{1+x}=\dfrac{1}{2}\tan^{-1}x$, then $x =$

(a) 1 (b) $\sqrt{3}$ (c) $\dfrac{1}{\sqrt{3}}$ (d)None of these

7. $\cos^{-1}\left(\cos\dfrac{7\pi}{6}\right) =$

(a) $\dfrac{7\pi}{6}$ (b) $\dfrac{5\pi}{6}$ (c) $\dfrac{\pi}{6}$ (d)None of these

8. The value of $\sin\cot^{-1}\tan\cos^{-1}x$ is equal to

(a)x (b) $\dfrac{\pi}{2}$ (c)1 (d) None of these

9. $\sin^{-1}\dfrac{\sqrt{x}}{\sqrt{x+a}}$ is equal to

(a) $\cos^{-1}\sqrt{\dfrac{x}{a}}$ (b) $\operatorname{cosec}^{-1}\sqrt{\dfrac{x}{a}}$ (c) $\tan^{-1}\sqrt{\dfrac{x}{a}}$ (d) None of these

10 If $\sin\left(\sin^{-1}\dfrac{1}{5}+\cos^{-1}x\right)=1$, then x is equal to

(a)1 (b)0 (c) $\dfrac{4}{5}$ (d) $\dfrac{1}{5}$

SECTION B

(This section comprises of very short answer type-questions (VSA) of 2 marks each.)

11. Evaluate $\tan^{-1}\left(tan\frac{2\pi}{3}\right)$

12. $\tan^{-1}(-3) = \frac{-\pi}{2} + \tan^{-1}\left(-\frac{-4}{3}\right)$

13. Find the domain of the function $\cos^{-1}(2x-1)$

SECTION C

(This section comprises of short answer type questions (SA) of 3 marks each)

14. Find the value of $\tan^{-1}\sqrt{3} - \sec^{-1}(-2)$

15. If $\tan^{-1}\sqrt{3} + \cot^{-1}x = \frac{\pi}{2}$ then find the value of x.

16. $\tan^{-1}2x + \tan^{-1}3x = \frac{\pi}{4}$ then find x.

SECTION D

(This section comprises of long answer-type questions (LA) of 5 marks each)

17. Show that $sin^{-1}\frac{12}{13} + tan^{-1}\frac{4}{5} + tan^{-1}\frac{63}{16} = \pi$

18. Show that $\frac{9\pi}{8} - \frac{9}{4}sin^{-1}\frac{1}{3} = \frac{9}{4}sin^{-1}\frac{2\sqrt{2}}{3}$

19. Two men either side of a temple of 30m high observe its top at the angles of elevation $\alpha \; and \; \beta$ respectively. The distance between the two men is $40\sqrt{3}$ and the distance between the first person A the temple is $30\sqrt{3}$m.

    (i) $< CAB = \; a \; then$

    $a)\; sin^{-1}\frac{2}{\sqrt{3}} \quad a)\; sin^{-1}\frac{1}{2} \quad a)\; sin^{-1}2 \quad a)\; sin^{-1}\frac{\sqrt{3}}{2}$

    (ii) $< CAB = \; a \; then$

    $a)\; cos^{-1}\frac{2}{\sqrt{3}} \quad a)\; cos^{-1}\frac{1}{2} \quad a)\; cos^{-1}2 \quad a)\; cos^{-1}\frac{\sqrt{3}}{2}$

    (iii) $< ABC =$ s