Class 12 Mathematics · Chapter 2: Inverse Trigonometric Functions

Worksheet · 20 marks · about 40 minutes · based on NCERT

Name _____ Class and section _____ Date _____

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1. Which of the following can never be the principal value of $\cos^{-1} x$, whatever $x \in [-1, 1]$ is? [1]

(a) $-\pi/6$ (b) 0
(c) π (d) $5\pi/6$

2. If $\cot^{-1} x = 5\pi/6$, then x equals [1]

(a) $-1/\sqrt{3}$ (b) $\sqrt{3}$
(c) $-\sqrt{3}$ (d) $1/\sqrt{3}$

3. The domain of the function $g(x) = \sec^{-1}(2x + 1)$ is [1]

(a) $(-1, 0)$ (b) $[-1, 0]$
(c) $(-\infty, -1] \cup [0, \infty)$ (d) $(-\infty, -1) \cup (0, \infty)$

4. The domain of the function $f(x) = \sin^{-1}(3x - 2)$ is [1]

(a) $[-1, 1]$ (b) $[1/3, 1]$
(c) $[-1/3, 1]$ (d) $[1, 3]$

5. If $\cos^{-1} x = 5\pi/6$, then $\sin^{-1} x$ equals [1]

(a) $\pi/3$ (b) $-\pi/3$
(c) $-\pi/6$ (d) $2\pi/3$

6. Find the value of $\tan^{-1}(\tan 2) + \cos^{-1}(\cos 5)$, the angles being in radians. [2]

7. Write $\sin^{-1}(x/\sqrt{(1 + x^2)})$, $x \in R$, in the simplest form. [2]

8. Explain why the inverse of cosine is defined with its principal range $[0, \pi]$ and not $[-\pi/2, \pi/2]$. [2]

9. Let $f(x) = 2 \sin^{-1}(1 - x)$. (a) Find the domain and the range of f. (b) Find x for which $f(x) = \pi/3$. [3]

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10. Show that $\cos^{-1}(2x^2 - 1) = 2\cos^{-1} x$ for $0 \le x \le 1$, and $\cos^{-1}(2x^2 - 1) = 2\pi - 2\cos^{-1} x$ for $-1 \le x \le 0$. [3]

11. Find the value of $\sin(2\tan^{-1}(1/3)) + \cos(\tan^{-1}(2\sqrt{2}))$. [3]

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