Section 6.4

Equations Involving Inverse Trigonometric Functions

Other Inverse Trig Functions

Problem 1. Solve for x given $y = 4\tan 3x$, where x is restricted to the interval $(-\frac{\pi}{6}, \frac{\pi}{6})$.

Note: You may find it a little confusing when they list the restriction on x as they did above. This point isn't emphesized much in the book and it appears you can get away with most problems ignoring the restriction. The next set of illustrates how such problems are normally solved.

Problem 2. Find another x where the follow is true: $-3\sqrt{2} = 6\cos\frac{x}{4}$, yet this time find an x that has a negative radian measure.

Problem 3. Find all possible x where $-3\sqrt{2} = 6\cos\frac{x}{4}$.

Problem 4. Solve for x given $y = 6\cos\frac{x}{4}$. List for which y values your solution is valid for and state the range of possible x for your solution.

Problem 5. Solve for x given $y = 6\cos\frac{x}{4}$ where you insist that x is a negative radian measure. List for which y values your solution is valid and state the range of possible x for your solution.

Problem 6. Solve for x given $\frac{y}{2} = -\sin(2x-1)$ when x is restricted to the interval $\left[\frac{2-\pi}{4}, \frac{2+\pi}{4}\right]$. You must justify why x is restricted to the given itnerval in your solution and state for which y your solution is valid.

Dealing with Inverse Functions in Equations

Problem 7. Solve for $\cos^{-1} x = \sin^{-1} \frac{1}{2}$. First by using what you already know concerning inverse trigonometric functions, and then algebraically.

Problem 8. Solve for $\arccos x - \arcsin x = \pi$.

Problem 9. Simplify the expression $\cos(\arcsin x + \arccos x)$. What conclusion can you derive about $\arcsin x + \arccos x$ with this?

Additional Problems to Practice

Problem 10. Solve for $y = \sin(3x) - 2$ for x in $\left[-\frac{\pi}{6}, \frac{\pi}{6}\right]$. You must justify that x is in the given interval for your solution. Also state for which y your solution is valid.

Problem 11. Find an exact solution to $2 \arccos\left(\frac{x-\pi}{3}\right) = 2\pi$.

Problem 12. Find an exact value for x where $\cos^{-1} x + \tan^{-1} x = \frac{\pi}{2}$.