Due Thursday, March 6, 2025.

Write your homework *neatly, in pencil*, on blank white $8\frac{1}{2} \times 11$ printer paper. Always *write the problem*, or at least enough of it so that your work is readable. If the problem involves a function, write the function. If the problem involves an equation, write the equation. Use words, and when appropriate, *write in sentences*.

Definition 1. We define the inverse trigonometric functions.

- $\arcsin : [-\pi/2, \pi/2] \to [-1, 1]$ such that $\arcsin(x) = y \Leftrightarrow x = \sin(y)$

- $\arccos : [0, \pi] \to [-1, 1]$ such that $\arccos(x) = y \Leftrightarrow x = \cos(y)$

- $\arctan : \mathbb{R} \to [-\pi/2, \pi/2]$ such that $\arctan(x) = y \Leftrightarrow x = \tan(y)$

- $\arcsin : (-\infty, -1] \cup [1, \infty) \to [0, \pi/2) \cup (\pi/2, \pi]$ such that $\operatorname{arcsec}(x) = y \Leftrightarrow x = \sec(y)$

We have shown that

- $\dfrac{d}{dx}\arcsin(x) = \dfrac{1}{\sqrt{1 - x^2}}$

- $\dfrac{d}{dx}\arctan(x) = \dfrac{1}{1 + x^2}$

- $\dfrac{d}{dx}\operatorname{arcsec}(x) = \dfrac{1}{|x|\sqrt{x^2 - 1}}$

Homework: Thomas Section 7.7 # 1, 13, 23, 29, 41, 61, 71, 79, 93, 101