SECTION 3.5 **Math 1000 Worksheet** FALL 2023

For practice only. Not to be submitted.

1. Find an exact value for each of the following expressions.

   (a) $\arcsin\left(-\dfrac{\sqrt{2}}{2}\right)$

   (b) $\arccos\left(-\dfrac{\sqrt{2}}{2}\right)$

   (c) $\operatorname{arcsec}\left(\dfrac{2\sqrt{3}}{3}\right)$

   (d) $\arctan\left(\tan\left(\dfrac{9\pi}{4}\right)\right)$

   (e) $\sin\left(\arccos\left(\dfrac{5}{13}\right)\right)$

   (f) $\cos(\arctan(2))$

2. Differentiate each of the following functions.

   (a) $y = \operatorname{arcsec}(\ln(x))$
   (b) $y = x^2 \arctan(3x)$
   (c) $y = \arcsin(\tan(t^2))$
   (d) $y = \tan(\arcsin(t^2))$

3. Find the equation of the line tangent to

$$f(x) = \arcsin\left(\frac{x-2}{2}\right) - 2\arcsin\left(\frac{\sqrt{x}}{2}\right)$$

   at $x = 2$.

4. Use implicit differentiation to find $\dfrac{dy}{dx}$, given

$$\sqrt{1 - x^2 y^2} = \arccos(xy).$$

5. Prove that $\dfrac{d}{dx}[\arccos(x)] = -\dfrac{1}{\sqrt{1 - x^2}}.$