MEMORIAL UNIVERSITY OF NEWFOUNDLAND

DEPARTMENT OF MATHEMATICS AND STATISTICS

SECTION 3.5 **Math 1000 Worksheet** FALL 2022

For practice only. Not to be submitted.

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

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

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

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

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

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

   (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 $\frac{dy}{dx}$, given

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

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