

MEMORIAL UNIVERSITY OF NEWFOUNDLAND  
DEPARTMENT OF MATHEMATICS AND STATISTICS

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SECTION 3.5

Math 1000 Worksheet

FALL 2024

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**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

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

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