

University of Bahrain
Department of Mathematics
MATHS101: Calculus I
Dr. Abdulla Eid



Worksheet: Derivative of inverse trigonometric functions

Students' Name: _____

1. Find the derivative of the following functions:

1. $y = \sqrt{\tan^{-1} x}$

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2. $y = \arcsin(3 - 2x)$

3. $y = x \sin^{-1} x + \sqrt{1 - x^2}$ and simplify your answer.

2. Show using calculus that

1. $\tan^{-1} x + \cot^{-1} x = \frac{\pi}{2}$

2. $\sec^{-1} x + \csc^{-1} x = \frac{\pi}{2}$

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3. Show that $\sec^{-1}(-x) + \sec^{-1}(x) = \pi$

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4. (At home) Show that

$$\tan^{-1} x + \tan^{-1} a = \tan^{-1} \left(\frac{x + a}{1 - ax} \right)$$

and use it to compute $\tan^{-1} 1 + \tan^{-1} 2 + \tan^{-1} 3$.

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