

**Math Xb Spring 2004**  
**Worksheet: Derivatives of Inverse Trig Functions**  
**March 19, 2004**

1. Let  $f(x) = \cos^{-1} x$ .

(a) Prove that  $f'(x) = -\frac{1}{\sqrt{1-x^2}}$ .

(b) Use the formula for  $f'(x)$  to explain why  $f$  is a decreasing function on its entire domain,  $[-1, 1]$ .

(c) Find  $f''(x)$  and use it to determine the intervals on which  $f$  is concave up and concave down.

2. Find the derivative of each of the following functions.

(a)  $f(x) = (\sin^{-1} x)^2$

(b)  $f(x) = \sin^{-1}(x^2)$

(c)  $f(x) = (\tan^{-1} x) \ln x$