

Math 1A Worksheet 19

March 17th, 2008

1. Find the following limits:

a)

$$\lim_{x \rightarrow -1^+} \sin^{-1}(x).$$

b)

$$\lim_{x \rightarrow 4\pi^-} \cos^{-1}(\cos x).$$

2. Sketch graphs of $f(x) = \sin(\sin^{-1} x)$ and $g(x) = \sin^{-1}(\sin x)$. Find $g'(x)$.
3. The graphs of $\sin^{-1}(x)$ and $\cos^{-1}(x)$ intersect in a single point. Find that point.
4. Let $y = \cos^{-1}(x)$. Use implicit differentiation and the formulas $\cos y = x$ and $\cos^2 + \sin^2 = 1$ to find a formula for $\frac{d}{dx} \cos^{-1}(x)$ in terms of x alone.
5. Find

$$\lim_{x \rightarrow \infty} \arctan \left(\frac{1}{\cos \left(\arcsin \left(\frac{\sqrt{x^2-1}}{x} \right) \right)} \right).$$