MATH 5B - Single Variable Calculus II — Spring 2019

§6.6 Inverse Trigonometric Functions

In-class Activity 6.6

Dr. Jorge Basilio

Pasadena City College

gbasilio@pasadena.edu

Activity 1:

(a) Simplify the expression: $\cos(\arctan(x))$

(b) Evaluate: $\lim_{x\to -5^-} \arctan\left(\frac{1}{x+5}\right)$

Activity 2:

Prove the following formulas:

(a) $\frac{d}{dx}\left[\arccos(x)\right] = \frac{-1}{\sqrt{1-x^2}}, \qquad -1 < x < 1$

(b) $\frac{d}{dx}\left[\arctan(x)\right] = \frac{1}{1+x^2}, \qquad -\infty < x < \infty$

Activity 3:

Find the derivatives of the following functions:

(a) $L(x) = x^3 \arctan(x) + e^x \ln(x)$

(b) $P(t) = 2^{t \arcsin(t)}$

(c) $m(z) = \left(\sin^{-1}(5z) + \tan^{-1}(4 - z)\right)^{27}$

(d) $s(y) = \arctan(\log_5(1 + y^2))$

Activity 4:

Evaluate the following anti-derivatives and definite integrals:

(a) $\int_0^{1/4} \frac{1}{\sqrt{1-4x^2}} dx$

(b) $\int \frac{1}{t^2+a^2} dt$

(c) $\int \frac{1}{w^4+16} dw$