

Math 1710: Tutorial 6 (inverse trig. functions and their derivatives)

1. Simplify the following expressions provided the expression is well-defined:

(a) $\pi/11$; (b) $\pi/11$;

(c) $\sin^{-1} \sqrt{3}$; (d) $-12/13$;

(e) $-15/8$; (f) $7/25$;

(g) $-25/24$; (h) -1 .

2. Hint: show that the LHS is constant and then use $x = 1$

3. (a) $\frac{2x}{\sqrt{2x^2 + 1}(x^2 + 1)}$;
(b) $\tan^{-1}(e^{-x}) + xe^x/(1 + e^{2x})$;
(c) $-3 \ln 4 \cdot 4^{3 \cos^{-1} x} / \sqrt{1 - x^2}$;
(d) $-2x^3 / \sqrt{1 - x^4}$;
(e) $x^{\cot^{-1} x} (\cot^{-1} x / x - \ln x / (1 + x^2))$;
(f) $\frac{(\sin^{-1} x)^9}{x^4} \left(\frac{10x}{\sqrt{1 - x^2}} - 3 \sin^{-1} x \right)$;
(g) $(x\sqrt{9x^2 - 1} \sec^{-1}(3x))^{-1}$

4. $y + 2 = (4 + 4/\pi)(x - 1)$