

Math 141, Problem Set #9  
(due **in class** Fri., 11/15/13)

**Note: To get full credit for a problem, it is not enough to give the right answer; you must explain your reasoning.**

Stewart, section 3.4, problems 8, 10, 12, 16.

Stewart, section 3.5, problems 14, 30, 38, 40, 42.

Stewart, section 3.7, problems 8, 16, 36, 41, 42, 55, 56.

Also, do the following additional problems.

- A. Differentiate  $\arctan x + \operatorname{arccot} x$  and explain why your answer makes sense (in the same vein as our discussion of  $\arccos x + \arcsin x$  in class).
- B. Show that the derivative of  $-\ln(\cos x)$  is  $\tan x$ . For what set of  $x$  does this hold?
- C. Show that the derivative of  $x \arctan x - \frac{1}{2} \ln(1 + x^2)$  is  $\arctan x$ .

Tip #1: Be careful about the domain of a function and the domain of the derivative of a function. Note in particular that the latter must be a subset of the former.

Tip #2: In your solutions, do not treat  $\inf$  as a number. I may sometimes write this on the board as an informal shorthand, but in written solutions I don't want to see things like  $\arctan(\inf) = \pi/2$  or  $\arctan(-\inf) = -\pi/2$ .

Please don't forget to write down on your assignment **who you worked on the assignment with** (if nobody, then write "I worked alone"), and write down on your time-sheet **how many minutes you spent on each problem** (this doesn't need to be exact).