

Homework 1 - Math 141, Frank Thorne (thornef@mailbox.sc.edu)

Due Friday, August 26

Important: As with everything else in life, being right is not enough. Please show your work, write in complete sentences, and explain your reasoning clearly.

- (a) Stewart, Ch. 1.1, 1, 5-6, 12, 13.
- (b) What is a function? (This is the most important question in all of mathematics.)
- (c) Describe examples of functions from at least three of the following categories: biology; physics or chemistry; geometry; economics or business; geography.
- (d) What are the domain and the range of a function? Give an example of a function whose domain is $[0, 5]$ and whose range is $[0, 3]$.
- (e) Does the equation $x^2 + y^2 = 1$ describe y as a function of x ? Why or why not? Answer the same for the equation $x^2 + y = 1$.
- (f) Stewart, Ch. 1.2, 10-12, 16.
- (g) Define the trigonometric functions $\sin(x)$, $\cos(x)$, $\tan(x)$, $\sec(x)$, $\csc(x)$, and $\cot(x)$.
- (h) Stewart, Ch. 1.3, 11-18 (**show your work**), 31, 32, 53, 56.
- (i) Define the exponential and logarithmic functions e^x and $\ln x$.
- (j) Stewart, Ch. 1.5, 9-10.
- (k) Define the term *inverse function*. Give an example of a function that has an inverse, and of a function that does not.
- (l) Define the logarithmic functions $\log_a(x)$ and $\ln(x)$.
- (m) Stewart, Ch. 1.6, 18 (in addition, graph the inverse of f), 21-24, 47-48.