

### Math 2130 Workshop: Calc 3 Prerequisites

Your workshop grades are based on participation: you will get a perfect score on this assignment if it appears you spent the class period on it. If you cannot solve one of the problems, you should review the corresponding material in the next week. Please come to office hours or visit the Math Support Center.

You are heavily encouraged to work with your fellow students on this assignment.

Please do not use a calculator on this particular assignment.

This workshop is intentionally long. Do not panic if you run out of time.

1) Compute  $\frac{d}{dt} \sqrt{t^2 + 1}$ .

2) Show that  $\sin^{-1}(x)$  and  $\csc(x)$  are different functions.

3) Find the absolute extremum of  $xe^x$ . Is it an absolute max or min?

4) Solve  $x^2 - 2x - 4 = 0$ .

5) Find both solutions to  $x^x = x^2$ .

**6)** An ellipse has two foci  $A$  and  $B$ , and is given by the set of all points  $P$  such that the sum of the distance from  $A$  to  $P$  plus the distance from  $P$  to  $B$  is constant. Locate the foci of the ellipse  $x^2 + 2y^2 = 1$ .

**7)** Compute  $\int_0^1 x e^x dx$ .

**8)** Compute  $\int \frac{x}{x^2+1} dx$ .

**9)** Find the point on the curve  $y = \ln x$  such that the tangent line at that point passes through the origin.

**10)** Compute the upper Riemann Sum of  $\sin(x)$  over the interval  $[0, \pi]$  using three equal width intervals.