

Homework 2 - Due 10:00 AM on Wednesday August 7

Solutions should be clear and organized. Make sure you justify your work.

1. Find the partial derivatives of  $f(x, y, z) = x^2y^3z^4 \cos(x)$

2. Evaluate

$$\lim_{x \rightarrow 0} \frac{e^x - x - 1}{x^2}$$

3. Let  $F(x) = \int_2^{x^2} t^2 + 1 dt$ , find  $F'(x)$ . (Hint: Use the fundamental theorem of calculus)

4. Evaluate  $\int \frac{x}{x^2+1} dx$

5. Evaluate  $\int e^x \sin(x) dx$

6. Evaluate  $\int \frac{3x+11}{x^2-x-6} dx$

7. Suppose that  $f$  is a function with the property that  $|f(x)| \leq x^2$  for all  $x$ . Show that  $f(0) = 0$ . Then show that  $f'(0) = 0$ .