Math 319 - Differential Equations II
Pre-Reading Assignment # 1
due 10am Tue Sep 9th, via email

Reading The first page of the file Charlines.pdf (Title: Method of Characteristic Lines). This is a summary of the Method of Characteristics as taught in class. On Thursday Sep 4th, we covered up to the calculation ending in $= bv_z$. So everything up to that point should look familiar. The document was written by Sylvie Desjardins for Math 319 in Fall 2013.

Questions 1. Consider the PDE

$$3\frac{\partial u}{\partial x} + 2\frac{\partial u}{\partial y} + 5u = \sin(xy). \tag{1}$$

(a) Find the preferred direction and the family of characteristic lines all parallel to the preferred direction vector.

(b) Write the equations for the new variables w and z in terms of x and y.

(c) Rewrite the PDE (1) in terms of the new variables.

(d) Form the integrating factor

$$\mu(z) = \exp\left(\int \frac{c}{b} dz\right).$$

2. Do you have any questions about the syllabus or midterms? Please let me know!