## Dr. Z.'s Calc5 Homework assignment 13

1. Find product solutions, if possible, to the partial differential equation

$$
\frac{\partial u}{\partial x}+5 \frac{\partial u}{\partial y}=0
$$

2. Find product solutions, if possible, to the partial differential equation

$$
11 \frac{\partial u}{\partial x}-5 \frac{\partial u}{\partial y}=0
$$

3. Find product solutions, if possible, to the partial differential equation

$$
x \frac{\partial u}{\partial x}=y \frac{\partial u}{\partial y}
$$

4. Find product solutions, if possible, to the partial differential equation

$$
\frac{\partial^{2} u}{\partial x^{2}}=9 \frac{\partial u}{\partial y}
$$

5. Find product solutions, if possible, to the partial differential equation

$$
\frac{\partial^{2} u}{\partial x^{2}}-u=9 \frac{\partial u}{\partial t}
$$

6. Find product solutions, if possible, to the partial differential equation

$$
\frac{\partial^{2} u}{\partial x^{2}}+3 \frac{\partial^{2} u}{\partial x \partial y}+\frac{\partial^{2} u}{\partial y^{2}}=0
$$

7. Classify the following pde as either elliptic, hyperbolic, parablic, or none.

$$
\frac{\partial^{2} u}{\partial x^{2}}=10 \frac{\partial^{2} u}{\partial x \partial y}-2 \frac{\partial^{2} u}{\partial y^{2}}+11 \frac{\partial u}{\partial x}-9 \frac{\partial u}{\partial y}
$$

8. Classify the following pde as either elliptic, hyperbolic, parablic, or none.

$$
\frac{\partial^{2} u}{\partial y^{2}}=2 \frac{\partial^{2} u}{\partial x \partial y}+\frac{\partial^{2} u}{\partial x^{2}}+\frac{\partial u}{\partial x}-4 \frac{\partial u}{\partial y}
$$

