NAME: (print!) _____

E-MAIL ADDRESS: (print!) _____

1. (5 points) Find the first two coefficients of the Fourier-Legendre expansion of

$$f(x) = \begin{cases} 2, & \text{if } -1 < x < 0; \\ -1, & \text{if } 0 \le x < 1. \end{cases}$$

2. (5 points) Find product solutions, if possible, to the partial differential equation

$$\frac{\partial u}{\partial x} = 25 \frac{\partial u}{\partial y} \quad .$$