1. [6pts] Show that on \((-\infty, \infty)\), the functions \(\sin^2 x, \cos^2 x\) are linearly independent but that the functions \(\sin^2 x, \cos^2 x, \cos 2x\) are linearly dependent.

2. [6pts] Find an integrating factor for the DE \(y' + ye^x = e^x\) and solve it.