1. Use the method of the separation of variables to find the general solution of

\[(x - 4)y^4 dx - x^3(y^2 - 3)dy = 0.\]

2. Find the integrating factor for the following DE

\[(1 + \cos x)y' = (\sin x + \sin x \cos x - y)\sin x, \quad 0 < x < \pi\]