1. Classify each of the following DEs as separable, linear, homogeneous, or Bernoulli. Do not solve.
(a) \((y - \sin^2 x) + y' \sin x = 1\)

(b) \(x^{2/3} y^{1/3} y' = 2x + 3y\)

(c) \((1 + x^2) y' + x^3 e^{2y} = 0\)

(d) \(3xyy' = 2y^2 + x^3 y^3\)

2. Verify that the DE \(ye^x \, dx + (2y + e^x) \, dy = 0\) is exact and then solve it.