Math 17B
Kouba
First-Order Linear Differential Equations

1.) Solve the following first-order linear differential equations.

a.) \( \frac{dy}{dx} + 2y = 5 \)

b.) \( \frac{dy}{dx} + y = e^{3x} \)

c.) \( y' + 3x^2 y = x^2 \)

d.) \( x^2 y' + xy = 1 \)

e.) \( (1 + x^2)y' + xy + x^3 + x = 0 \)

f.) \( xy' + (1 + x)y = e^{-x} \sin 2x \)

g.) \( \frac{dy}{dx} = y + x \)

h.) \( y' = 2y + xe^{2x} \) and \( y(0) = 2 \)

i.) \( \cos x \cdot \frac{dy}{dx} + y \sin x = 1 \)

j.) \( y' + y = \frac{1 - e^{-2x}}{e^x + e^{-x}} \)

k.) \( (1 + x)y' - xy = x + x^2 \)

l.) \( \cos^2 x \sin x \cdot \frac{dy}{dx} + y \cos^3 x = 1 \)