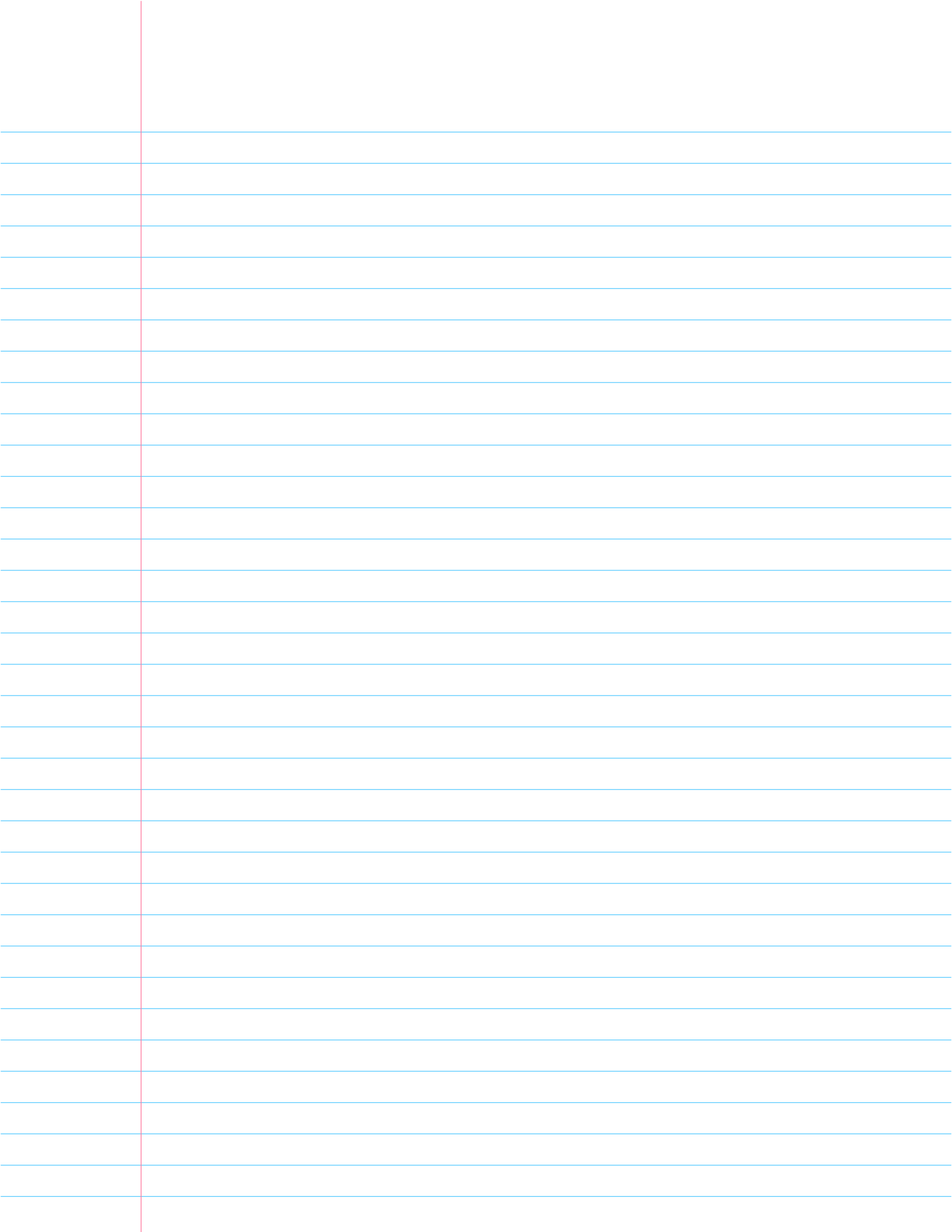


4.2 - Reduction of Order

$$a_2(x)y'' + a_1(x)y' + a_0(x)y = 0 \quad (1)$$



The indicated function $y_1(x)$ is a solution of the given differential equation. Use reduction of order (the process or the formula) to find a second solution $y_2(x)$.

Ex: $y'' + 9y = 0; \quad y_1 = \sin 3x$

Ex: $6y'' + y' - y = 0; \quad y_1 = e^{x/3}$

Ex: $x^2 y'' - 3xy' + 5y = 0; \quad y_1 = x^2 \cos(\ln x)$

Ex: The indicated function $y_1(x)$ is a solution of the associated homogeneous equation. Use the method of reduction of order [the process] to find a second solution $y_2(x)$ of the homogeneous equation and a particular solution $y_p(x)$ of the given nonhomogeneous equation.

$y'' - 4y' + 3y = x; \quad y_1 = e^x$

