Tarea 7

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$$x^2y'' + 2xy' - 2y = 0$$

$$y_1 = x$$

$$y_1 = x, \qquad y_1' = 1, \qquad y_1'' = 0$$

Sutitución: $x^2(0) + 2x(1) - 2x = 0$✓

Encontramos u

$$y'' + \frac{2x}{x^2}y' - \frac{2y}{x^2} = 0 \quad \rightarrow \quad y'' + \frac{2y'}{x} - \frac{2y}{x^2} = 0$$

$$P(x) = \frac{2}{x}, \qquad Q(x) = -\frac{2}{x^2}$$

$$u = \int \frac{e^{-\int \frac{2}{x}dx}}{(x)^2}dx \ \rightarrow \ \int \frac{e^{-ln|x|}}{x^2}dx \ \rightarrow \ \int \frac{x^{-2}}{x^2}dx$$

$$u = -\frac{1}{3}x^{-3}, \qquad y_2 = uy_1 \ \rightarrow \ y_2 = -\frac{1}{3}x^{-3}x$$

$$\therefore y_2 = -\frac{1}{3}x^{-2}$$

Solución general

$$y = C_1x - C_2\frac{1}{3}x^{-2} \ \rightarrow \ y = C_1x + C_2x^{-2}$$