$$(1-x^2)y'' - 2xy' + 2y = 0 \qquad y_1 = x$$

a) $y_1' = 1$
$y_1'' = 0$

$$(1-x^2)(0) - 2x(1) + 2(x)$$
$$-2x + 2x = 0$$

y_1 es solución

b) $(1-x^2)y'' - 2xy' + 2y = 0$

$$y'' - \frac{2x}{1-x^2}y' + \frac{2}{1-x^2}y = 0$$

$$y_2 = y_1 \int \frac{e^{-\int p\,dx}}{y_1^2}\,dx \rightarrow \Rightarrow e^{-\int p\,dx} = e^{-\int \frac{2x}{1-x^2}dx} = e^{\int \frac{-2x}{1-x^2}dx}$$

$$y_2 = x \cdot \int \frac{1-x^2}{x}\,dx \qquad \Rightarrow e^{\ln|1-x^2|} = \underline{1-x^2|} \qquad = \int \frac{-2x}{1-x^2}dx = \ln|1-x^2|$$

$$y_2 = x \cdot \left[\int \frac{1}{x}dx - \int x\,dx\right]$$

$$y_2 = x\left[\ln|x| - \frac{x^2}{2}\right]$$

$$\boxed{y_2 = x\ln|x| - \frac{x^2}{2}}$$

c)

$$y_1 = x \qquad y_2 = x\ln x - \frac{x^2}{2}$$
$$y_1' = 1 \qquad y_2' = \ln(x) + 1 - x$$

$$|W| = \begin{vmatrix} x & x\ln|x| - \frac{x^2}{2} \\ 1 & \ln|x| + 1 - x \end{vmatrix}$$

$$|W| = x(\ln|x| + 1 - x) - x\ln|x| + \frac{x^2}{2}$$

$$|W| = x\cancel{\ln|x|} + x - x^2 - x\cancel{\ln|x|} + \frac{x^2}{2}$$

$$|W| = x - \frac{x^2}{2} \neq 0$$

son linealmente independientes.

$|w| = x - \frac{x^{2}}{2} \neq 0$ son linealmente independientes.