Math 3280 Worksheet 21: Solution bases and the Wronskian

Group members (2 to 4): _____

Note there is a part 2 on the other side of the page.

(1) Find a basis for the subspace defined by the following equations for $(x_1, x_2, x_3, x_4, x_5) \in \mathbb{R}^5$:

$$\begin{aligned} 2x_1 + x_3 - 2x_4 - 2x_5 &= 0 \\ x_1 + 2x_3 - x_4 + 2x_5 &= 0 \\ -3x_1 - 4x_3 + 3x_4 - 2x_5 &= 0 \end{aligned}$$

(2) Compute the Wronskian of the quadratic Bernstein polynomials $f_1 = x^2$, $f_2 = 2x(1-x)$, $f_3 = (1-x)^2$. What can you conclude about their linear independence?