Problem.

Study **Theorem 5.1.4** and its proof in the textbook, then answer the following questions:

1. Use separation of variables to complete the proof of (5.1.29). For the exposition of **separation of variables**, study **Section 2.2**.

2. Use the Theorem to find the Wronskian of a given set $\{y_1, y_2\}$ of solutions of

$$(1 - x^2)y'' - 2xy' + \alpha(\alpha + 1)y = 0,$$

given that $W(0) = 1$. (This is Legendre's equation.)