**Class 10: Bessel's Integral formula and Orthogonality of Bessel functions**

**1.** If $\alpha$ and $\beta$ are distinct roots of the equation $AJ_n(x) + BxJ_n'(x) = 0$ where $\alpha$ and $\beta$ are constants, show that $\int_0^1 xJ_n(\alpha)J_n(\beta x)dx = 0$

**2.** Prove that $y = J_n(3x)$ is a solution of the equation $x^2y'' + xy' + \left(9x^2 - n^2\right)y = 0$

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