Homework # 3

Due: 9/29/2024

Problem 1) Verify the harmonic winding factor for the fractional pitch, uniformly distributed winding.

Problem 2) Calculate the magnetizing inductance of the above winding.

Problem 3) Verify the mutual inductance between a uniformly distributed and a sinusoidally distributed winding.

Problem 4) A uniform air-gap machine has an axial length of 1m, a rotor radius of 0.5 m, and a gap length of 0.50 cm. The rotor and the stator are each wound with a sinusoidally distributed 4-pole winding with 50 turns per pole. If the rotor and stator coil axes are aligned and the two windings connected in series, how much current should be passed through the windings to produce a peak air-gap flux density of 0.8 weber/m^2?