

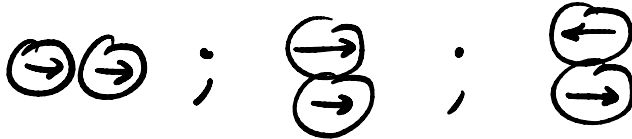
(40 pts)

Problem 5.19. Calculate the magnetic field distribution around a spherical permanent magnet with a uniform magnetization $\mathbf{M}_0 = \text{const.}$

Bonus: Attempt to estimate the force in 3 configurations

(or calculate)

This is about calculating the field of lucky balls!



(40 pts)

Problem 5.20. A limited volume V is filled with a magnetic material with a fixed (field-independent) magnetization $\mathbf{M}(\mathbf{r})$. Write explicit expressions for the magnetic field induced by the magnetization, and its potential, and recast these expressions into the forms more convenient when $\mathbf{M}(\mathbf{r}) = \mathbf{M}_0 = \text{const}$ inside the volume V .

(40 pts)

Problem 5.21. Use the results of the previous problem to calculate the distribution of the magnetic field \mathbf{H} along the axis of a straight permanent magnet of length $2l$, with a round cross-section of radius R , and a uniform magnetization \mathbf{M}_0 parallel to the axis – see the figure on the right.

