Task. By using mass[M], length[L], time[T], and current[A], find the dimension of permeability.

Solution.

Answer. Permeability is the measure of the ability of a material to support the formation of a magnetic field within itself. It is denoted by letter μ and measured in $[N] \cdot [A]^{-2}$, where [N] means "newton" and [A] means "ampere". We should express $[N] \cdot [A]^{-2}$ via [M], [L], [T] and [A].

Notice that [N] the measure for the force F. Using newton law $F = ma$, where m is the mass and a is the acceleration measured in m/s^2 we see that

$$[N] = [M] \cdot [L]/[T]^2 = [M] \cdot [L] \cdot [T]^{-2}$$

Hence the measure for permeability can be written as follows:

$$[N] \cdot [A]^{-2} = [M] \cdot [L] \cdot [T]^{-2} \cdot [A]^{-2}.$$

Answer. $[M] \cdot [L] \cdot [T]^{-2} \cdot [A]^{-2}$.