

## DRAWING #6.1: GAUSS'S LAW FOR MAGNETISM

THE FACT THAT MAGNETIC FIELD LINES DO NOT BEGIN OR END ALLOWS US TO DIRECTLY WRITE DOWN AN EQUATION SIMILAR TO GAUSS'S LAW IN ELECTROSTATICS:

$$\oint_S da B_n = 0$$

$B_n$ : THE NORMAL COMPONENT OF  $\mathbf{B}$   
OVER A SURFACE

THIS RESULT IS KNOWN AS GAUSS'S LAW FOR MAGNETISM (IN INTEGRAL FORM).

THIS CAN BE UNDERSTOOD, FOR EXAMPLE, BY CONSIDERING THE MAGNETIC FIELD AS REPRESENTING THE FLOW OF SOMETHING THAT IS CONSERVED; ANYWHERE WE WERE TO PLACE A CLOSED SURFACE WOULD EITHER HAVE FIELD LINES PASSING THROUGH IT, OR FORMING CLOSED LOOPS INSIDE IT.