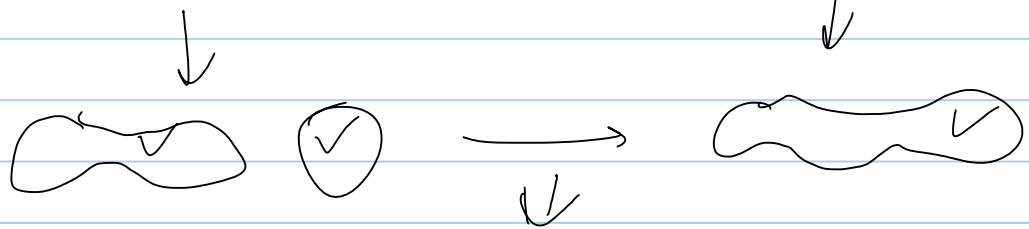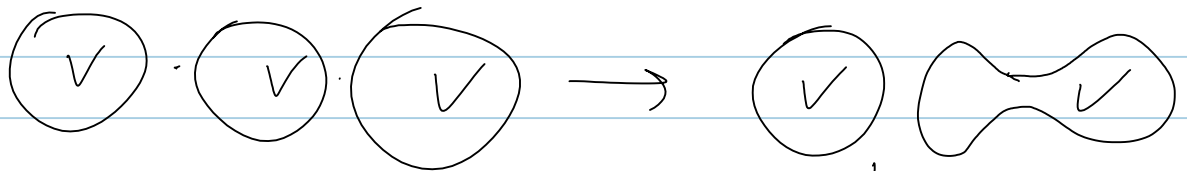$V$, & $W$ are graded, so is

$$(V \otimes W)_k = \bigoplus_{i+j=k} V_i \otimes W_j$$

$$q \dim (V \otimes W) = (q \dim V) \cdot (q \dim W)$$

$$f = \sum a_i q^i \qquad g = \sum b_j q^j$$

$$(f \cdot g) = \sum_k \left( \sum_{i+j=k} a_i b_j \right) q^k$$

$$dx^i \wedge dx^j = - dx^j \wedge dx^i$$



$$V \otimes V \otimes V \xrightarrow{\;1 \otimes m\;} V \otimes V$$

$$m \otimes 1 \downarrow \qquad\qquad \downarrow m$$

$$V \otimes V \xrightarrow{\;m\;} V$$

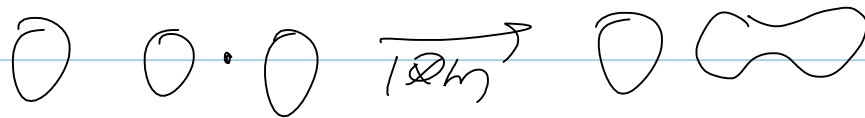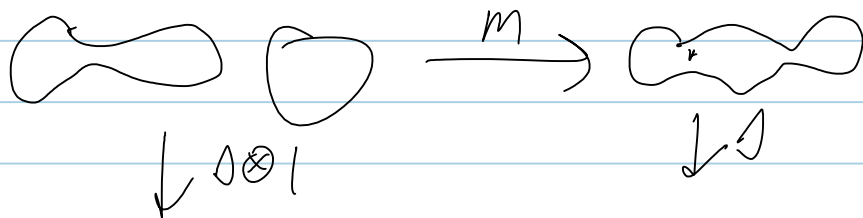$$(1 \otimes m) /\!/ m = (m \otimes 1) /\!/ m \qquad\qquad m : V \otimes V \to V$$

$$m \circ (1 \otimes m) = m \circ (m \otimes 1) \qquad \text{``product''}$$

$m$ is associative, commutative

$\Delta$ is co-assoc. co-commut. co-product



"$m$ & $\Delta$ are compatible as above"

"Frobenius algebra"

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