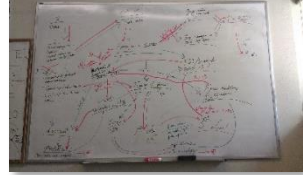


Parity

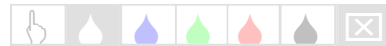
Physics 564
Dr. Toggerson



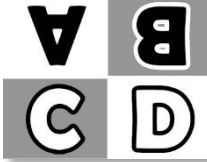
Some questions



- What is the multiplication table for $\hat{\Pi}$?
 - Is it Abelian?
 - Is $\hat{\Pi}$ unitary?
- What is the
 - Trivial rep?
 - Non-Trivial 1-Rep?
 - The 4 rep that acts on a 4-vector $\begin{pmatrix} t \\ x \\ y \\ z \end{pmatrix}$

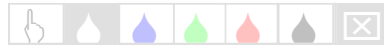


What about the following?



1. Even
2. Odd

1. $\Pi^+ m \Pi$ where m is mass.
2. $\Pi^+ p \Pi$
3. $\Pi^+ L \Pi$
4. $\Pi^+ B \Pi$
5. $\Pi^+ \Phi_B \Pi$

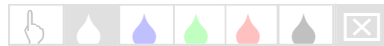


Summary of Quantities



Quantity	Parity	Examples
Scalar	Even	Mass
Pseudoscalar	Odd	Magnetic flux (any $\vec{a} \cdot (\vec{b} \times \vec{c})$)
Vector	Odd	Momentum
Pseudovector (axial vector)	Even	Angular momentum (any cross product)

- Parity is multiplicative $\Pi_{\text{system}} = \Pi_1 \Pi_2 \dots$
- For interactions which conserve parity, you cannot add different parities any more than you can add vectors and scalars.
 - Why its $F = q(\vec{E} + \vec{v} \times \vec{B})$



Parity in the QMHO

states with even parity

states with odd parity

