

The dimensions of fusion objects are highly constrained. Jones proved the first result in this direction.

Theorem (Jones, Index for subfactors, '83)

If $1 < \dim V < 2$, then $\dim V = 2 \cos(\pi/n)$.

Proof.

These are the only real algebraic integers less than 2 which are maximal amongst their conjugates. □

Theorem (Coste-Gannon, '94)

Every dimension is a cyclotomic integer.

Proof.

Entries of the S -matrix of the Drinfeld center are cyclotomic. □

Theorem (Calegari-Morrison-Snyder, CMP '10)

If $2 < \dim V < 76/33$, then $\dim V$ is one of

$$\frac{\sqrt{7} + \sqrt{3}}{2}, \sqrt{5}, 1 + 2 \cos(2\pi/7), \frac{1 + \sqrt{5}}{\sqrt{2}}, \frac{1 + \sqrt{13}}{2}$$

Proof.

These are the only real cyclotomic integers less than $76/33$ which are maximal amongst their conjugates. □