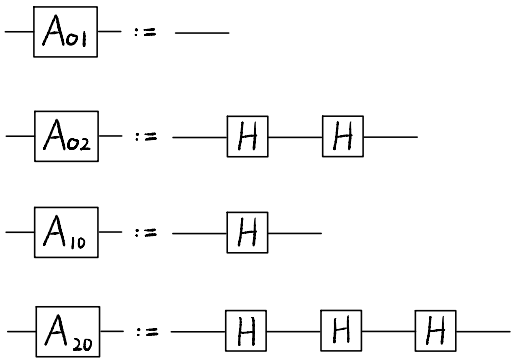


C2: $H^4 = I$

Lem 1 By definition and C_2, we have 1. (1) H A_{01} = A_{10}

(2) H A_{02} = A_{20}

(3) H A_{10} = A_{02}

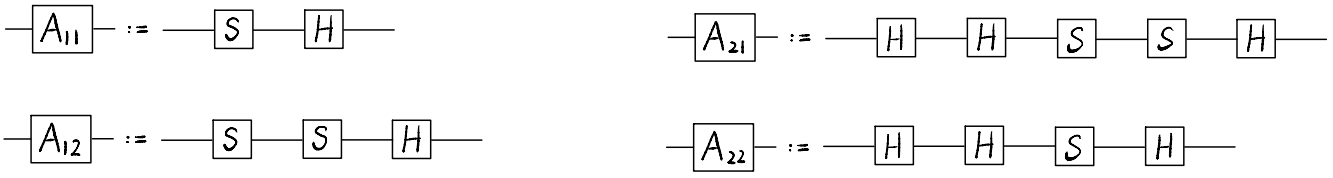
(6) H A_{20} = A_{01}

Proof 1. (1). LHS := H =: A_{10} = 1. (1). RHS

1. (2). LHS := H H H =: A_{20} = 1. (2). RHS

1. (3). LHS := H H =: A_{02} = 1. (3). RHS

1. (6). LHS := H H H H $\overset{C_2}{=}$ — =: A_{01} = 1. (6). RHS.



C2: $H^4 = I$

R1: $H\ S\ H = S\ S\ H\ S^2\ X^2 \cdot (-w^2)$

R1': $H\ S\ S\ H = H\ H\ S\ H\ X\ S \cdot (-w)$

Lem 2 By definition, C2 & R1, we have /.

(4) $H\ A_{11} = A_{12}\ S^2\ X^2 \cdot (-w^2)$

(5) $H\ A_{12} = A_{22}\ X\ S \cdot (-w)$

(7) $H\ A_{21} = A_{11}\ X\ S \cdot (-w)$

(8) $H\ A_{22} = A_{21}\ S^2\ X^2 \cdot (-w^2)$

Proof: /. (4). LHS $:= H\ S\ H \overset{R1}{=} S\ S\ H\ S^2\ X^2 \cdot (-w^2)$

$=: A_{12}\ S^2\ X^2 \cdot (-w^2) =$ /. (4). RHS

/. (5). LHS $:= H\ S\ S\ H \overset{R1'}{=} H\ H\ S\ H\ X\ S \cdot (-w)$

$=: A_{22}\ X\ S \cdot (-w) =$ /. (5). RHS

/. (7). LHS $:= H\ H\ H\ S\ S\ H$

$\overset{R1'}{=} H\ H\ H\ H\ S\ H\ X\ S \cdot (-w)$

$\overset{C2}{=} S\ H\ X\ S \cdot (-w)$

$=: A_{11}\ X\ S \cdot (-w) =$ /. (7). RHS

/. (8). LHS $:= H\ H\ H\ S\ H$

$\overset{R1}{=} H\ H\ S\ S\ H\ S^2\ X^2 \cdot (-w^2)$

$=: A_{21}\ S^2\ X^2 \cdot (-w^2) =$ /. (8). RHS //