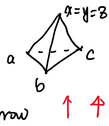
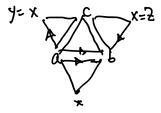
# Ch2 orientation examples

2020年10月13日 星期二

① Since we apply SYM at each step, The orientation "induced" by previous orientation is actually consistent.

② At $P_1$, we store the orientation and view $0=1=2$, $4=5=6$.
At $P_3$, we just compare marked one and the orientation induced by previous one.

$S^2 \simeq$ 


| abc | bca | cab | bac | cba | acb |
|---|---|---|---|---|---|
| 0 | 1 | 2 | 4 | 5 | 6 |

Red arrow ↑ ↑ ↑ means comparison at $P_3$.


$(\mu,0)$ ←

Start with $(\mu,0)$ i.e. abc.
First apply SYM get $(\mu,4)$ i.e. bac.
Then apply FNEXT, that is the triangle sharing the same edge ba with bac. We get bax, i.e. $\mu_x$. Since $(\mu_x,0)=abx$, $(\mu_x,4)=bax$. Thus we get $(\mu_x,4)$


$(\mu,0)$ ← $(\mu_x,4)$ ←

Now we consider $b_x$ by $b_2$ in $(\mu_x,4)$

Here $\tau = 0, 1, 2, 4, 5, 6$

| abx | bxa | xab | bax | xba | axb |
|---|---|---|---|---|---|

Hence $FNEXT(SYM(\mu_x,4)) = FNEXT(\mu_{x0}) = (\mu,0)$

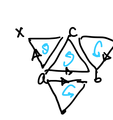

marked.
$(\mu,0)$
$(\mu,0)$ ← $(\mu_x,4)$ ←

Following steps are similar as above.


$(\mu,0)$ ← $(\mu_x,4)$ ← $(\mu,0)$ $(\mu_2,4)$ ←


$(\mu,0)$ ← $(\mu_x,4)$ ← $(\mu,0)$ $(\mu_2,4)$ ← $(\mu_x,5)$ $(\mu,1)$ ← marked. $(\mu_y,5)$ ← marked.


cxb cxa. axc.
$(\mu,0)$ ← $(\mu_x,4)$ ← $(\mu,0)$ $(\mu_2,4)$ ← $(\mu_x,5)$ $(\mu,1)$ $(\mu_y,5)$ ← $(\mu_2,4)$ $(\mu,1)$ $(\mu_x,4)$ } all marked.




$(\mu,0)$ ← $(\mu_x,4)$ ← $(\mu,0)$ $(\mu_2,4)$ $(\mu_y,4)$ ← $(\mu_x,5)$ $(\mu,1)$ $(\mu_y,5)$ ← $(\mu_2,6)$ $(\mu,2)$ $(\mu_x,6)$
marked


$(\mu,0)$ ← $(\mu_x,4)$ $(\mu_y,6)$ $(\mu_2,5)$ ← $(\mu,0)$ $(\mu_2,4)$ $(\mu_y,4)$ ← $(\mu_x,5)$ $(\mu,1)$ $(\mu_y,5)$ ← $(\mu_2,6)$ $(\mu,2)$ $(\mu_x,6)$
marked.

Above each pair "↑" or "↑" or "↑" give the boolean value "true". Hence the sphere is orientable. #

The readers can also compute the projective plane if they are interested.

$\mathbb{RP}^2 \simeq$