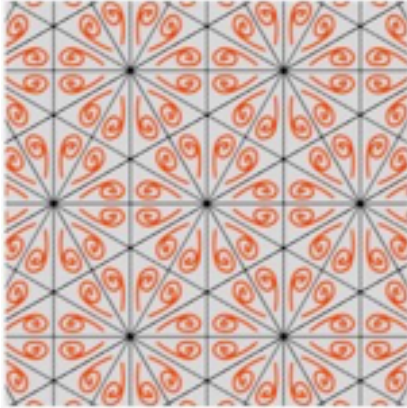
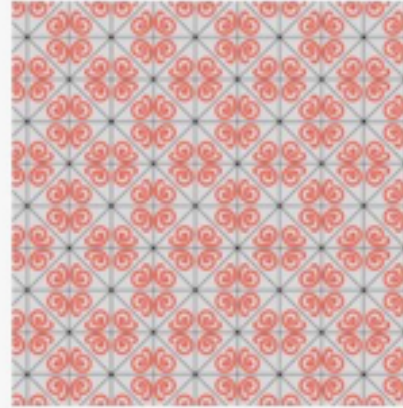


Handout 1

Cards with orbifold signatures



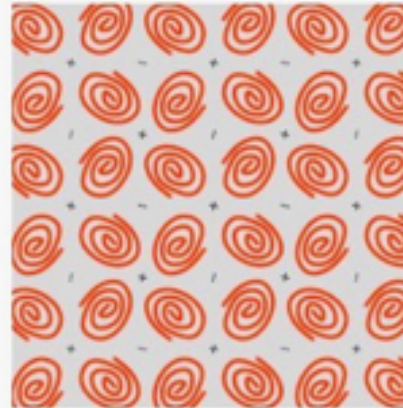
***632**



***442**



632



442

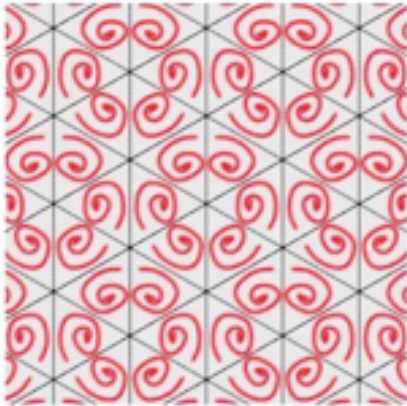


22x

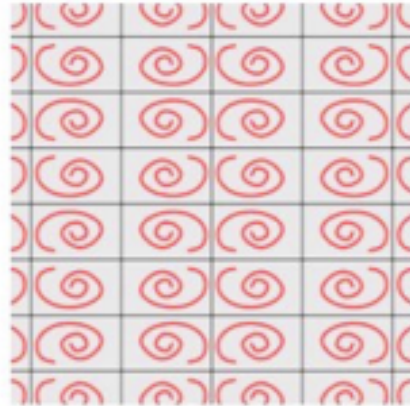


22*

Handout 1



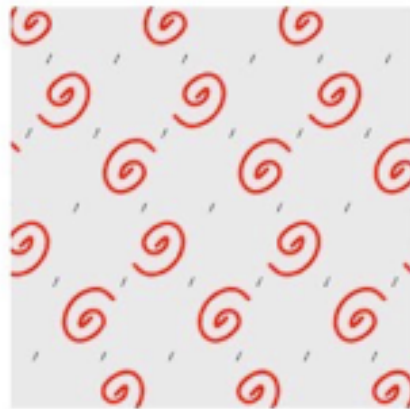
***333**



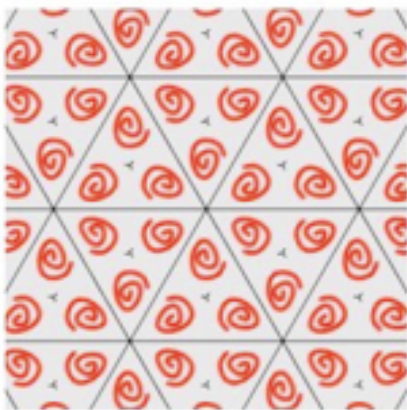
***2222**



333



2222

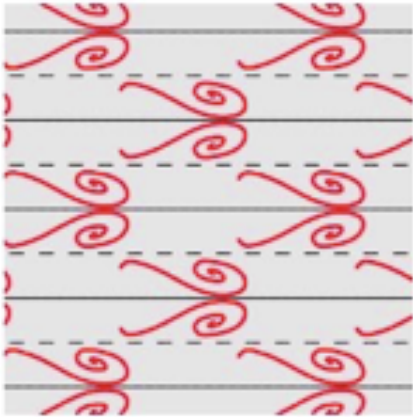


3*3

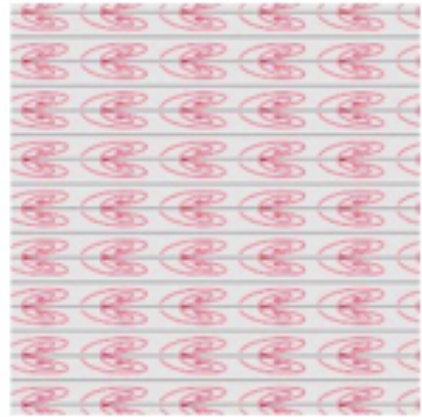


4*2

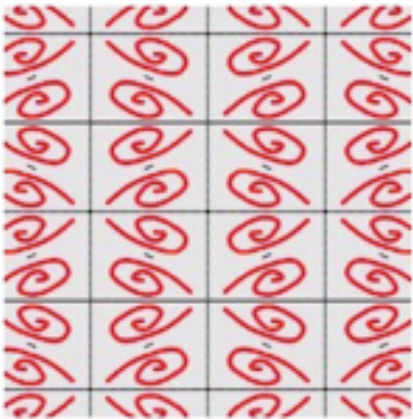
Handout 1



*X



**



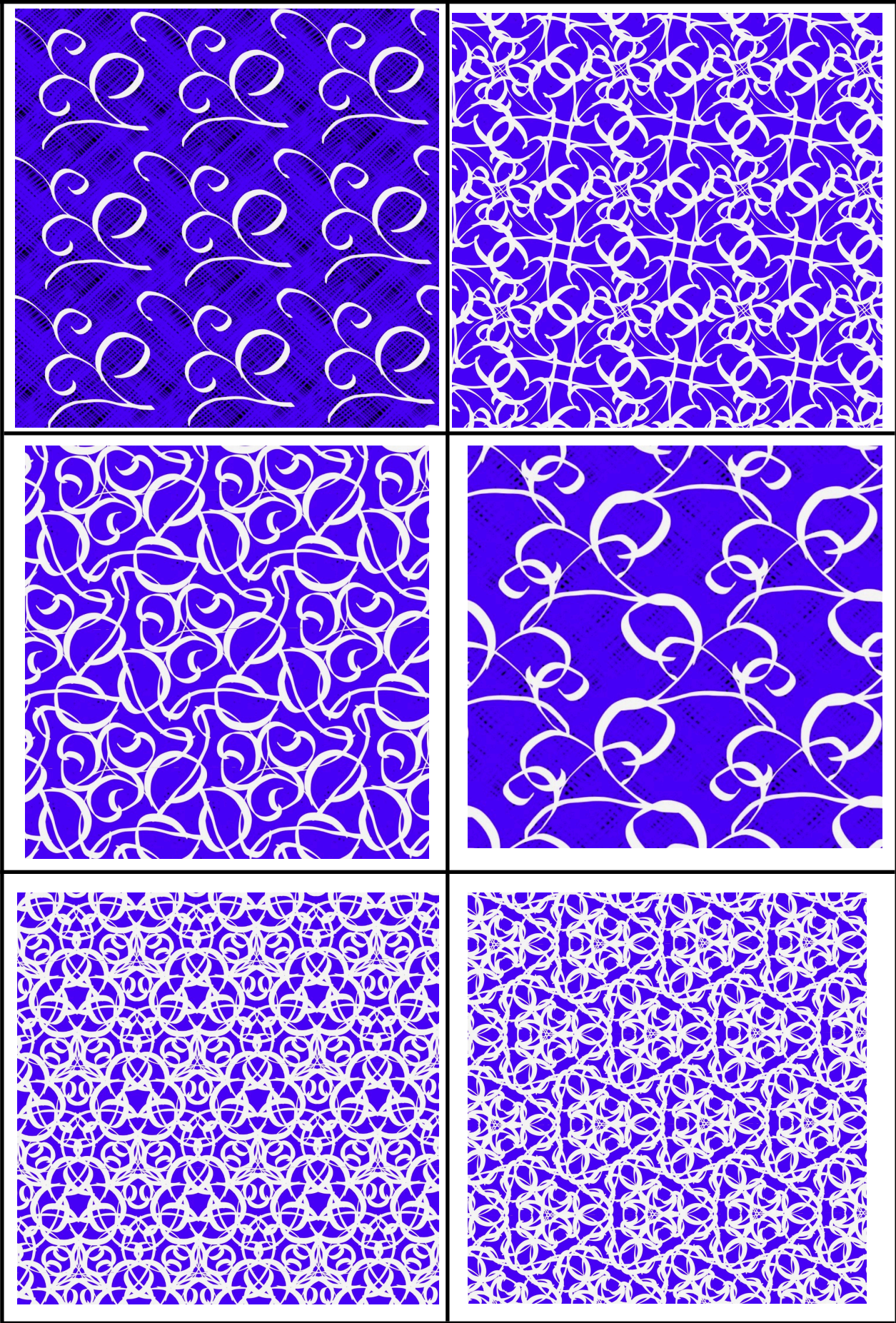
2*22

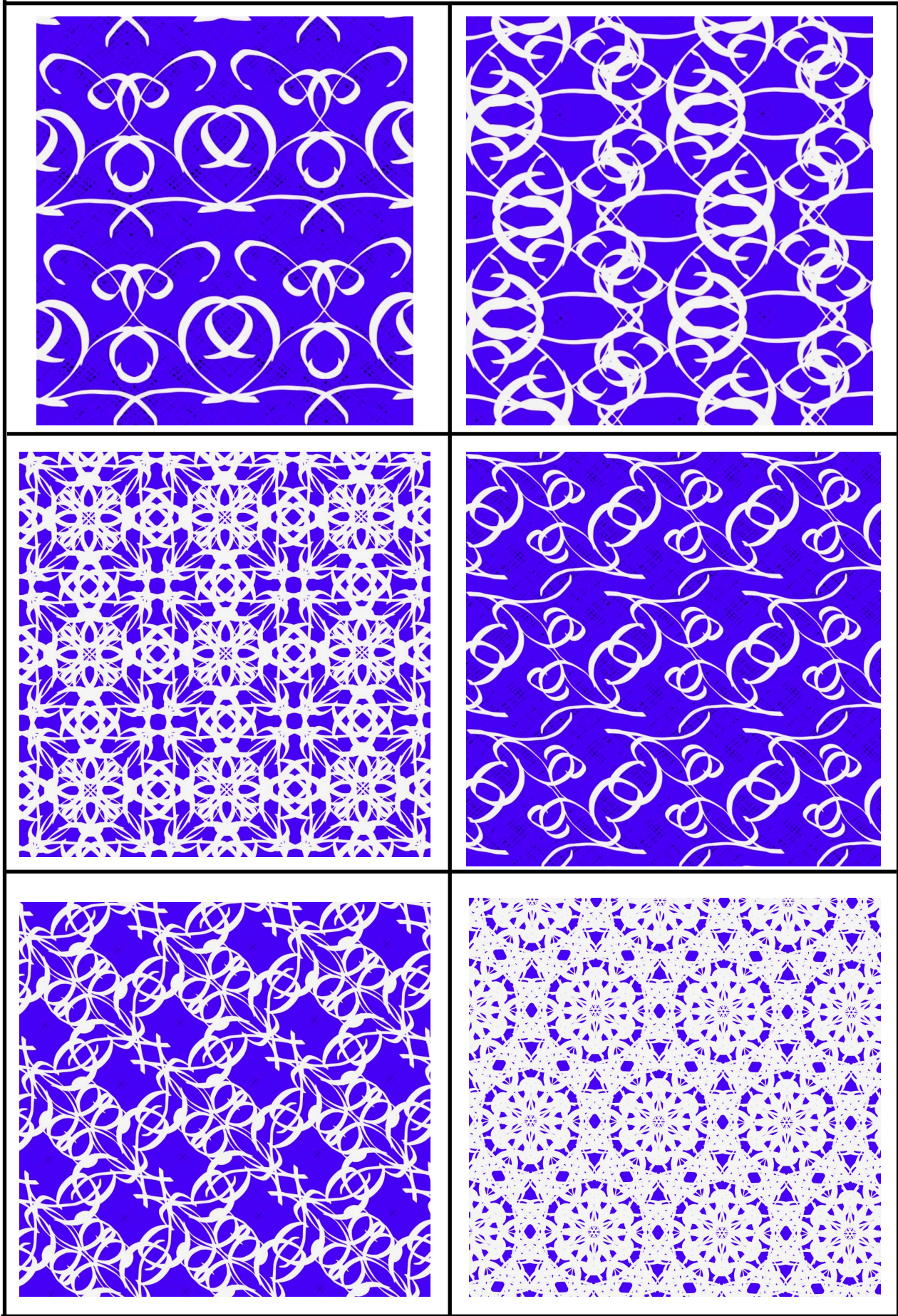


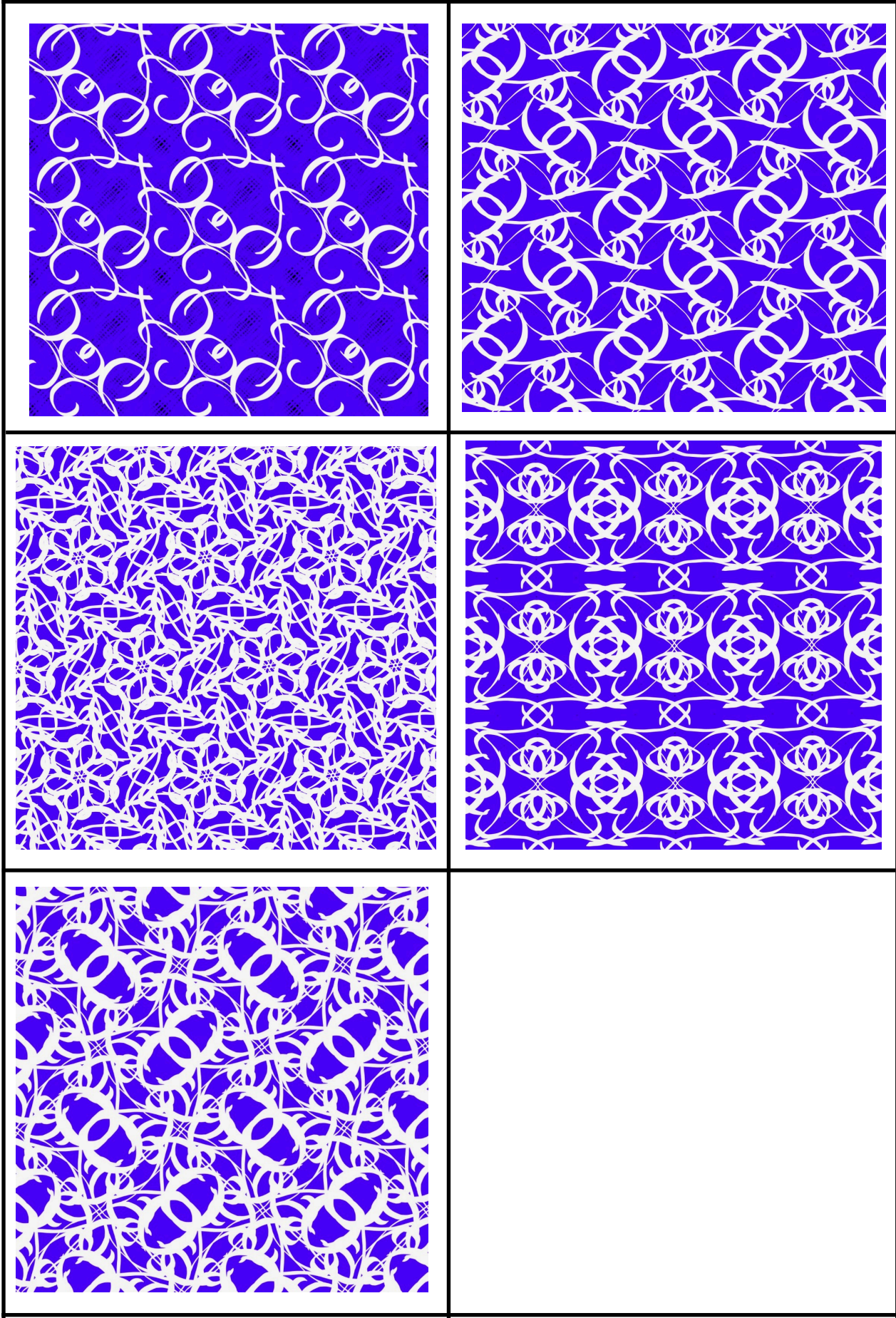
XX



O

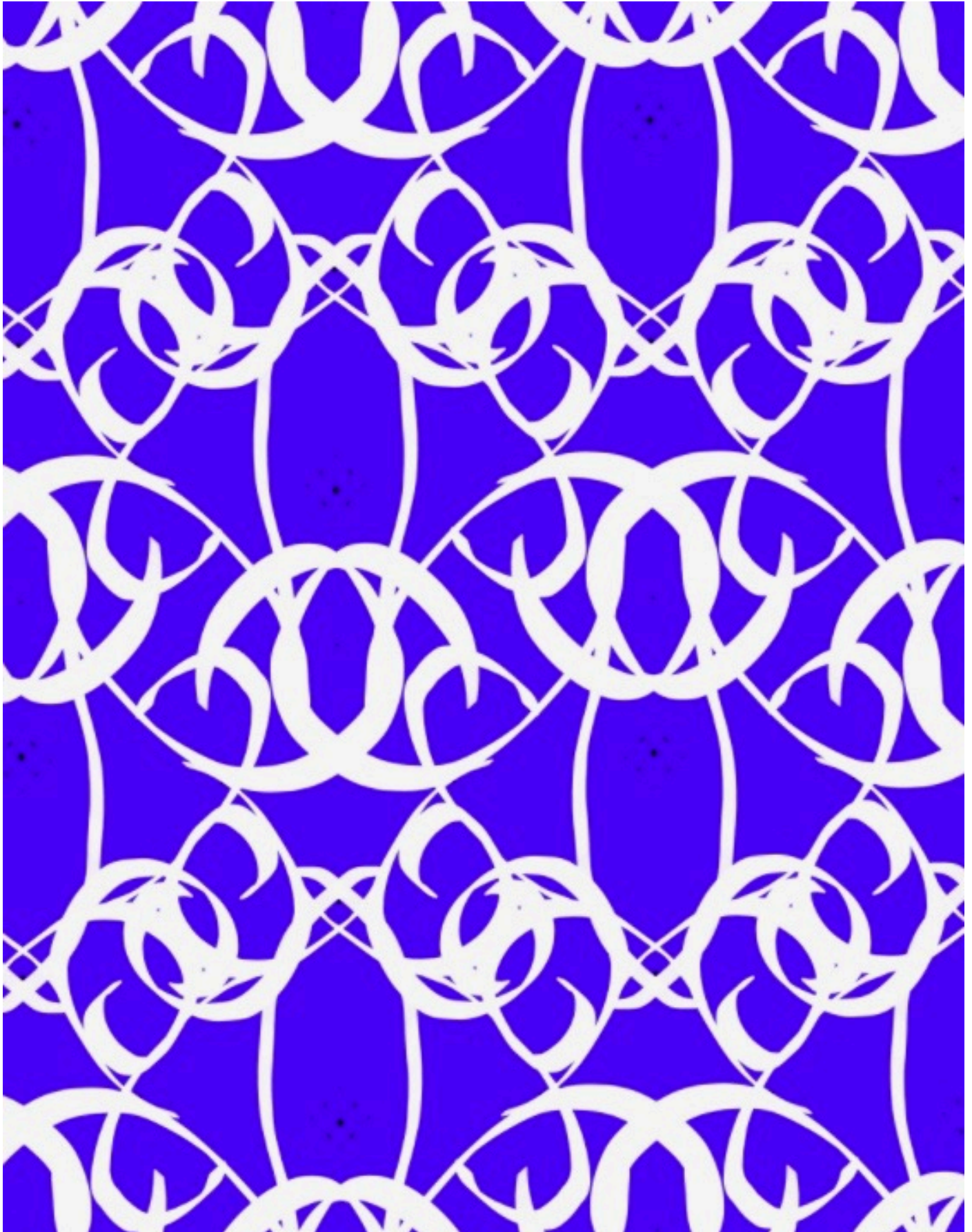






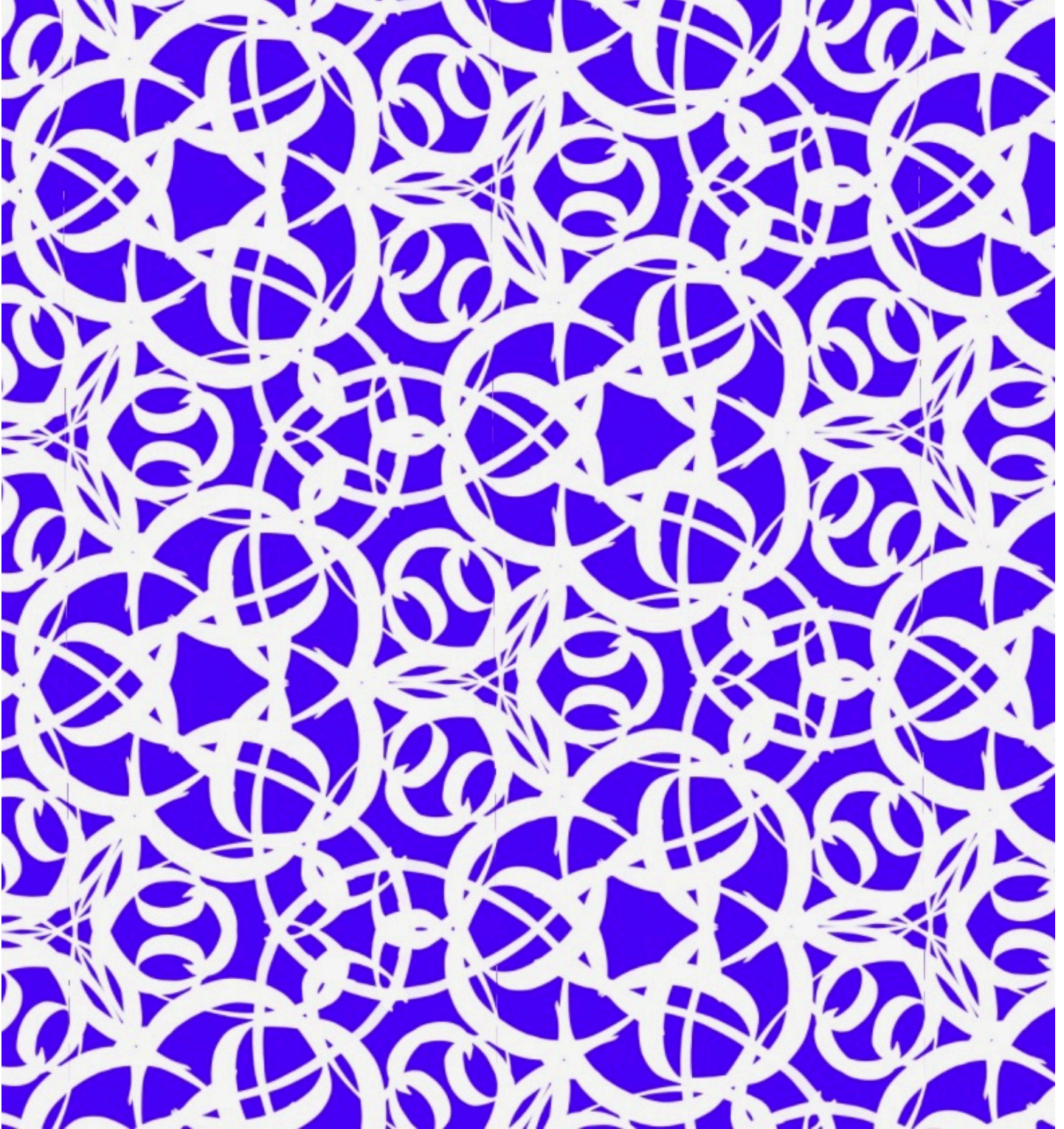
Handout 3

This is pattern 22*.



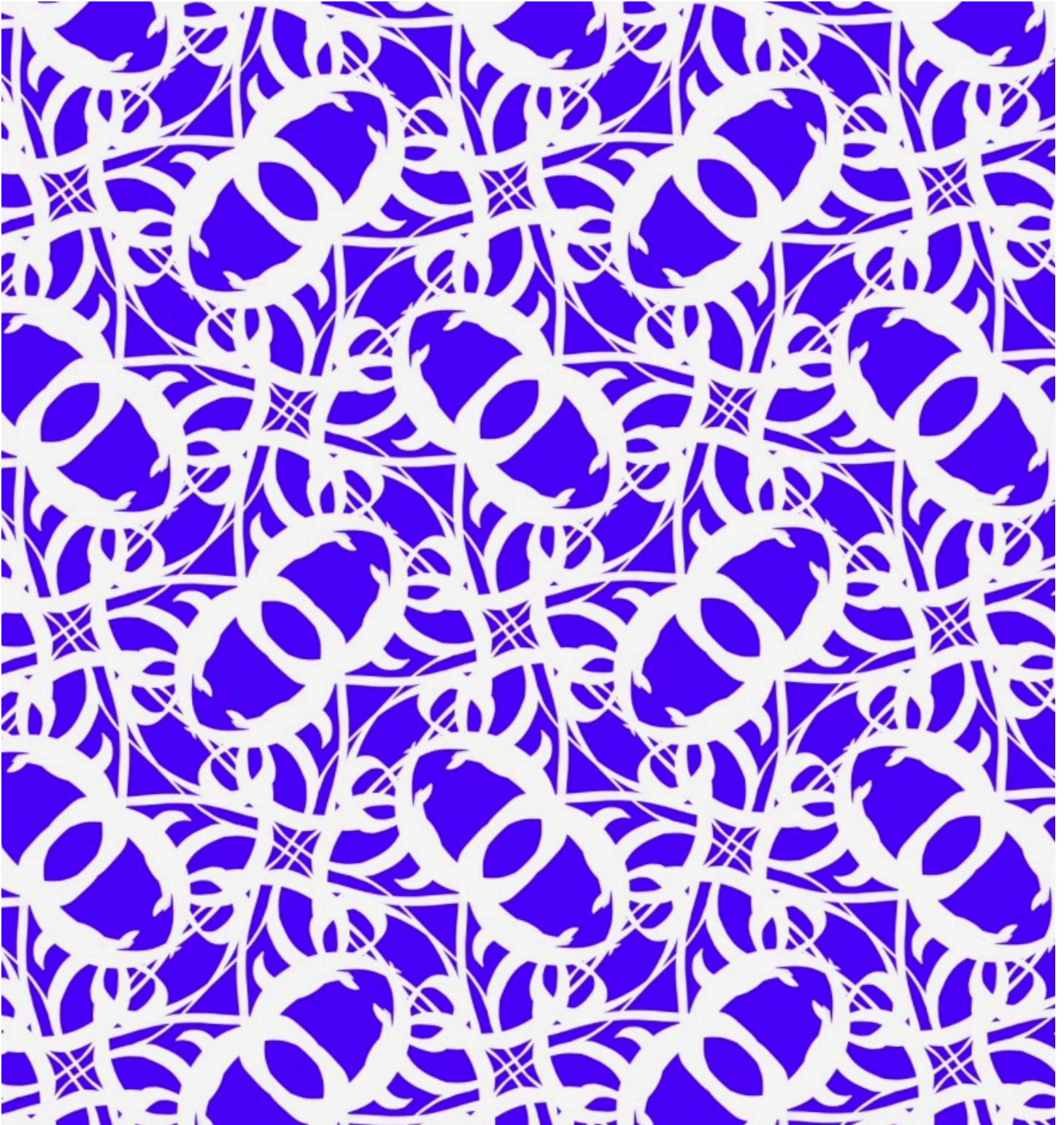
Handout 3

This is pattern *333.



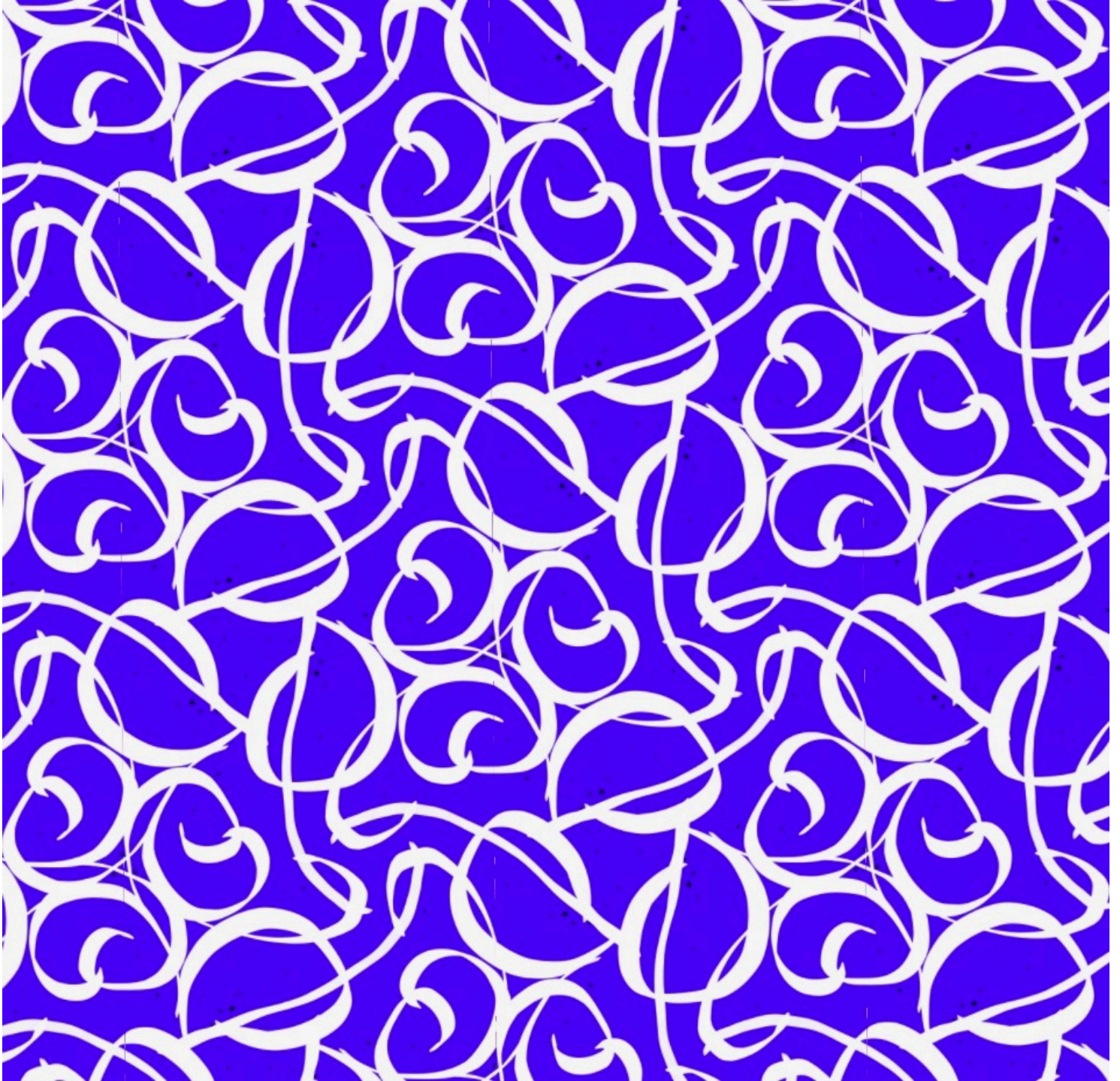
Handout 3

This is pattern 4*2.



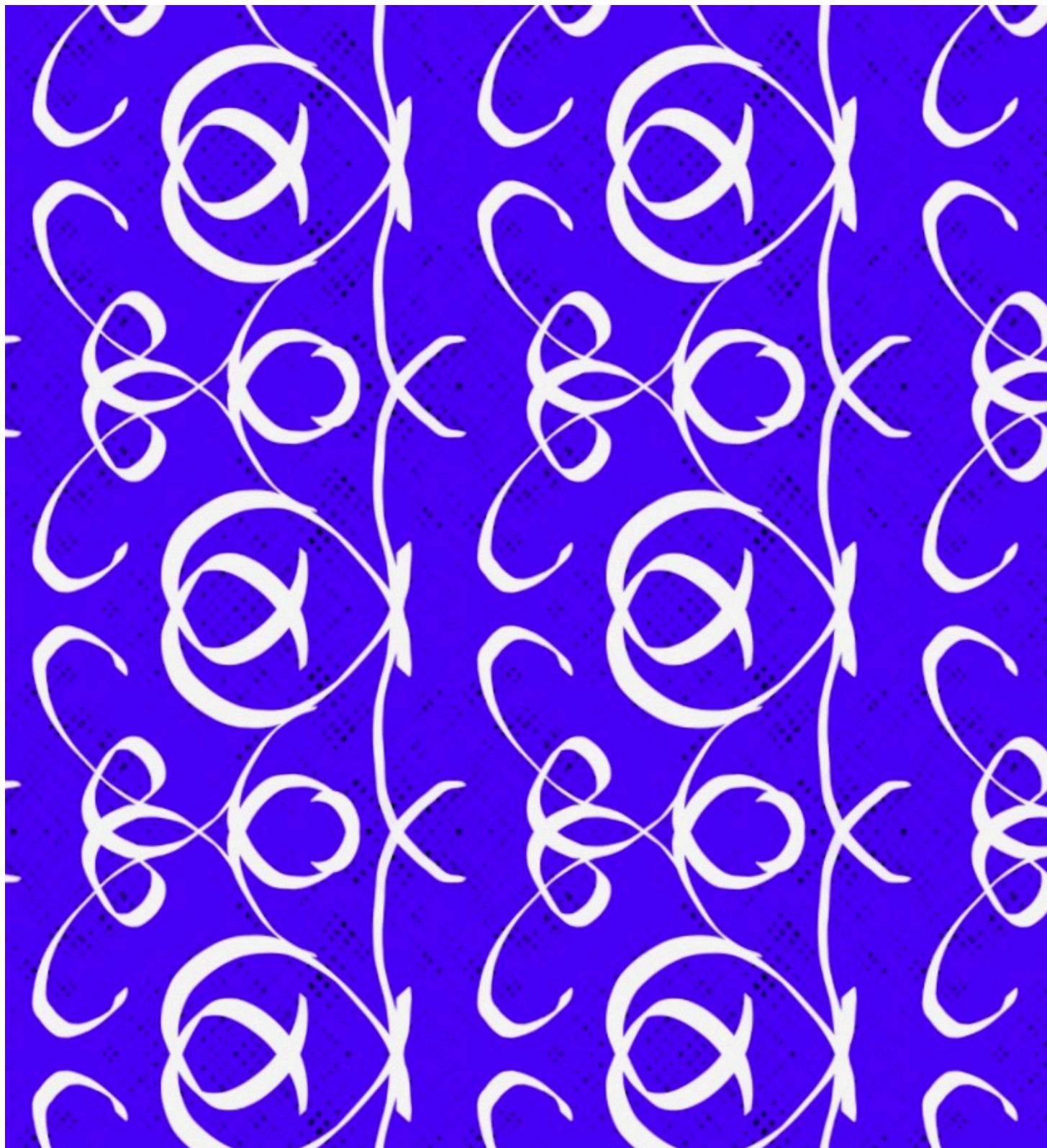
Handout 3

This is pattern 333.

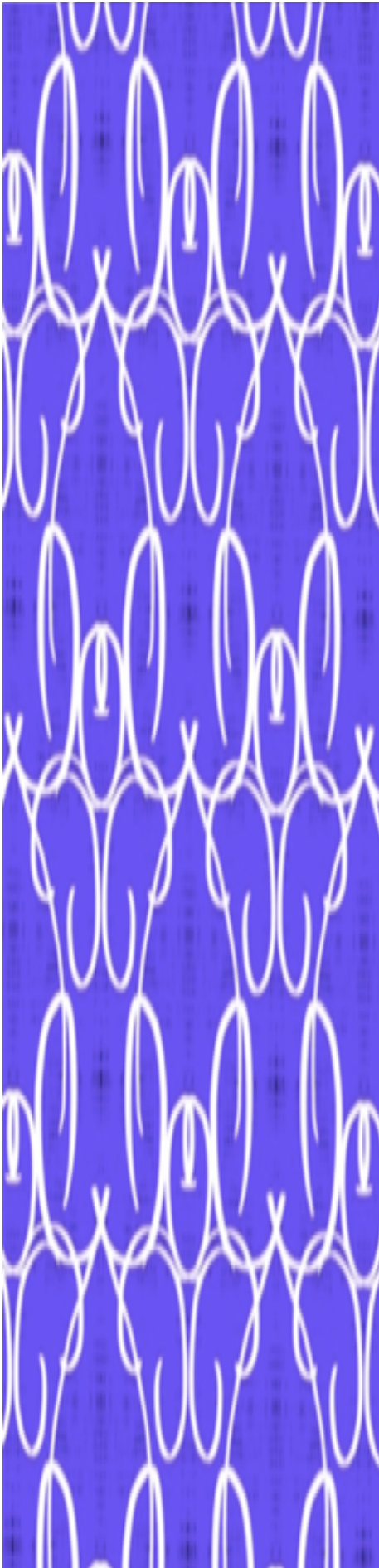


Handout 4

This is **. The orbifold looks like a cylinder, but is topologically an annulus.



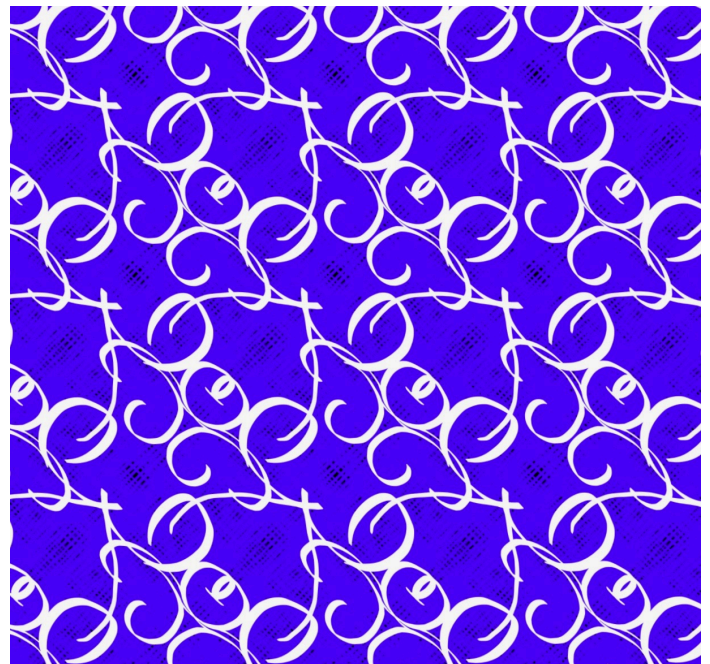
Handout 5



This is pattern *x.

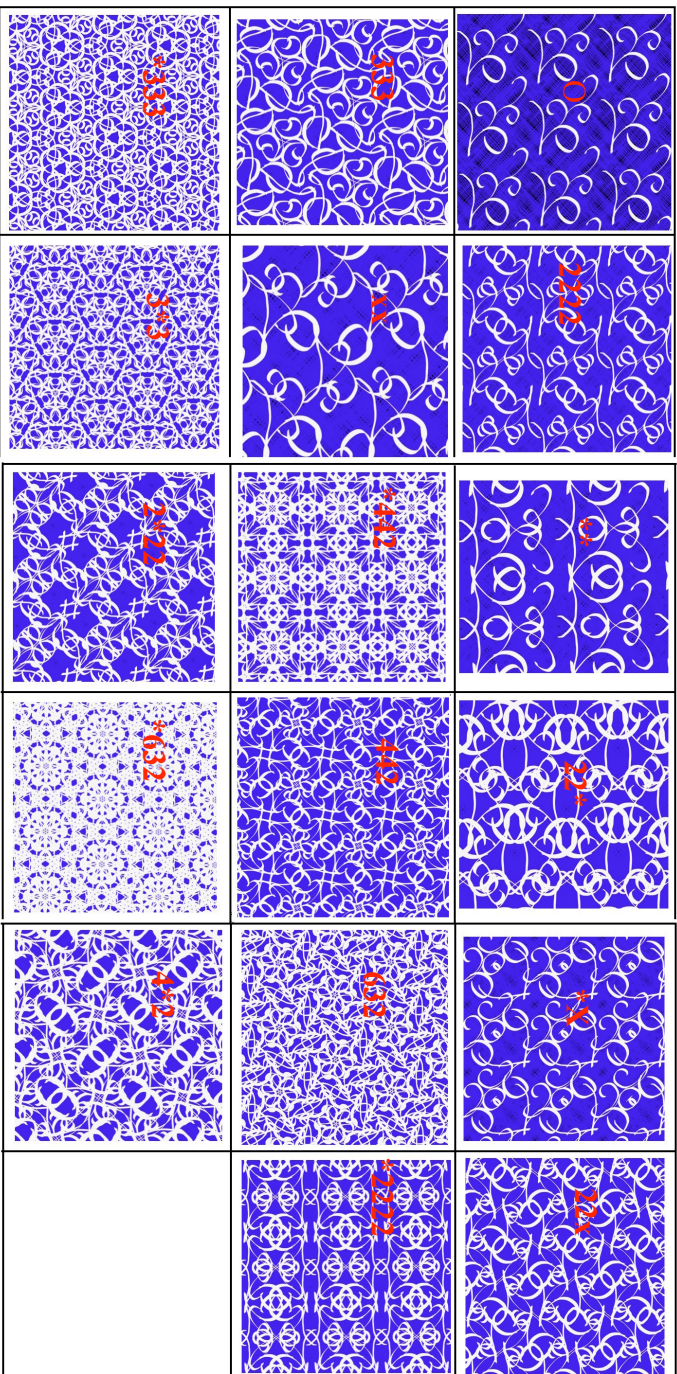
Cut out the pattern to the left. Mark mirror reflections with red pencil. Note that between the mirrors there is a glide reflection. Fold on the mirrors, tape along the side and cut one copy of the fundamental region. Twist and tape where the pattern matches end to end.

This is *X elongated so that it can be twisted into a moebius strip. This was elongated using Graphic Converter. First the pattern was rotated 45 degrees, then trimmed and stretched vertically. The pattern still has mirror reflections and a glide reflection.



Handout 6

Key for the card matching



O	2222	*	22*	*X	22X
333	XX	*442	442	632	*2222
*333	3*3	2*22	*632	4*2	

Orbifold Signature	Orbifold Description	Makeable?
O	Topological torus	yes, but surface passes through itself
2222	Sphere with 4 cone points can be a flat "pillow" or tetrahedral, depending on angle between translations	yes
**	Annulus	yes
XX	Klein bottle	no
*X	Mobius strip	yes
*2222	rectangle	yes
22X		no
22*	Topological disk with two cone points (a boat)	yes
2*22	topological disk with one cone point and two corner points	yes
442	Sphere with 3 cone points (45-45-90 triangle but 2-sided)	yes
*442	45-45-90 triangle	yes
4*2	Topological disk with one cone point and one corner point	yes
333	Sphere with 3 cone points (equilateral triangle but 2-sided)	yes
*333	Equilateral triangle	yes

Handout 6

Key for the card matching

3*3	Topological disk with one cone point and one corner point	yes
632	Sphere with 3 cone points (30-60-90 triangle but 2-sided)	yes
*632	30-60-90 triangle	yes