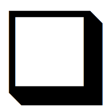


NAME:

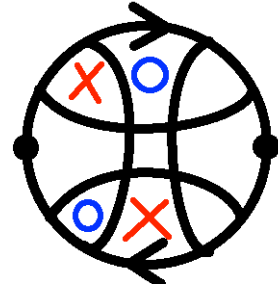
1. [3] (4/5 Class) Identify one key difference between Flatland the book and Flatland the movie. Explain why you think the movie makers made this change.
2. [3] (Weeks §1) Explain how A Square used red and blue string to motivate his fellow flatlanders into making a map of Flatland.

3. [4] (HW3 #4) Group the following images into sets that have the same topology.

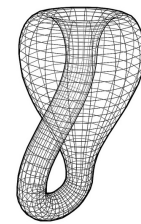
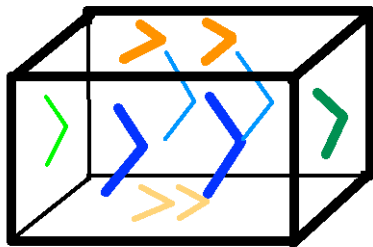
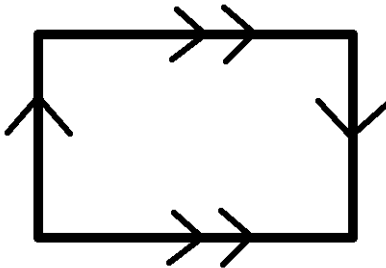
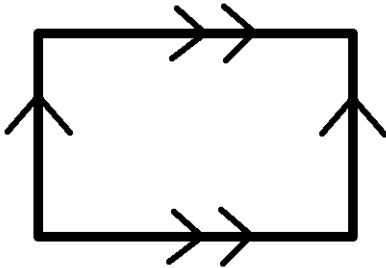


4. [2] (TED Video) Provide two non-decorative or artistic used for origami from “the real world”.

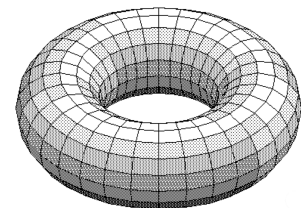
5. [3] (Weeks §3) A tic-tac-toe board being played on a projective plane is shown to the right. The game was started by X and now it is X 's turn. What is X 's best move? Justify your choice.



6. [6] Match the items on the left to items with the same topology on the right.

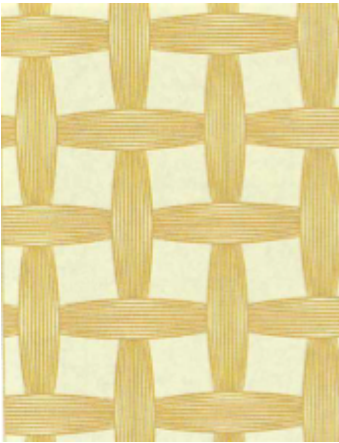


3D flat torus



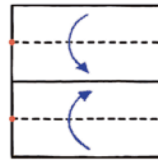
7. [3] (Weeks §3) Find a closed homogeneous 1 manifold.

8. [4] (HW2 #1) Find the signature for each of the following.

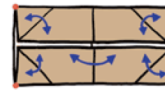


9. [2] (4/19 Class) Examine the Origami instructions to the right. What is the meaning of the circled instruction?

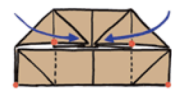
F.W.'s Origami Wombat



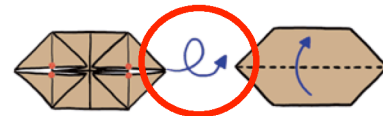
Crease the paper along the middle. Fold the top and bottom edges in to meet the crease.



Crease this shape up the middle. Fold all the corners over creasing them, and then unfold them again.



Bring the corners down while folding where I've made dotted lines. This will create four new points that meet in the middle.



Flip this shape over so that you are looking at the smooth side.

Fold the shape along the middle so that you bring the bottom edge up to meet the top edge.



This is the body of the wombat. Now it's time to give it some legs!



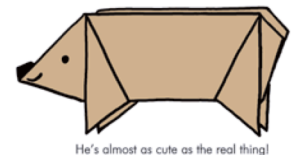
Fold the triangles that meet in the middle down so that they now extend down past the bottom of the body.



On one end of the wombat fold the point up for the nose. On the other end fold the point in.



Now fold the nose over one more time. Then use the marker to color it in and to add eyes and a mouth.



He's almost as cute as the real thing!

©2007 Moo-Cow Fan Club LLC.

www.moocowfanclub.com

10. [5] (HW3 #1) Identify all possible signatures of a two dimensional tiling that includes only red symbols and the symbols *32. Be sure to explain clearly *how* you know you have found all the possibilities!

Symbol	Cost (\$)	Symbol	Cost (\$)
○	2	* or ×	1
2	$\frac{1}{2}$	2	$\frac{1}{4}$
3	$\frac{2}{3}$	3	$\frac{2}{6}$ or $\frac{1}{3}$
4	$\frac{3}{4}$	4	$\frac{3}{8}$
5	$\frac{4}{5}$	5	$\frac{4}{10}$ or $\frac{2}{5}$
6	$\frac{5}{6}$	6	$\frac{5}{12}$
...
n	$\frac{n-1}{n}$	n	$\frac{n-1}{2n}$

NAMES:

The Largest Equilateral Triangle

inspired by Thomas Hull's "What's the biggest Equilateral Triangle in a Square" in *Project Origami, activities for exploring mathematics*.

1. [5] Find a way to fold an equilateral triangle inside a patty paper. Recall that an equilateral triangle is a triangle with all sides the same length. Explain your methods clearly and consider providing diagrams.
2. [10] Find the largest equilateral triangle that will fit on a patty paper. *Justify* that you have found the largest equilateral triangle. Hint: use the corners of the patty paper and consider symmetry!