

Agenda:

1. Return & discuss exams
2. *Flatland* and the Fourth Dimension
  - Sec. 6.1 and 6.2 (exerpts)
  - *Flatland* the movie

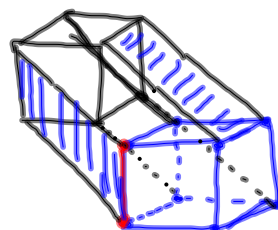
Reminder: *Seminars on Teaching Math* tomorrow at 4pm in here.  
 "A collection of SMART and Engaging Classroom Activities"

Nov 4-1:19 PM

1. Begin with a single point.
2. Move the point 1 unit to produce a line segment.
3. Move the segment 1 unit to produce a square.
4. Move the square 1 unit to produce a cube.
5. Move the cube 1 unit to produce a 4-D *hypercube*.

Complete the following table:

Dimension	Figure	v	e	f	s	h	Euler characteristic $\chi = v - e + f - s + h$
0	pt.	1					1
1	line	2	1				2-1=1
2	square	4	4	1			4-4+1=1
3	cube	8	12	6	1		8-12+6-1=1
4	hyper cube	16	32	24	8	1	$\chi = 16 - 32 + 24 - 8 + 1 = 1$



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In the book *Flatland* by Edwin Abbot, A. Square is a 2-dimensional being who is visited by a strange creature from 3-dimensional space.

Abbot's *Flatland* is a political satire among other things, and must be read with that in mind.

The movie adaptation modernizes the setting somewhat.

\* e.g. women are no longer represented as line segments, as they were depicted in Abbot's book.

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Discussion Questions:

1. What would it look like if a hypercube entered our "space"?
2. Return to the Table and complete the row for the hypercube. What is its Euler characteristic?
3. Explain how A. Square escaped from his prison cell at the end of the movie.
4. Explain how the rings could have ended up on the table leg on p. 198 of your text.
5. In the movie, creatures were able to change their orientation to face one another. This is a bit of a stretch... discuss why.

Additional HW: Sec. 6.1 #6-10, 16; Sec. 6.2 #6-9, 14

Nov 4-1:53 PM