CS 240: Computer Graphics
Midterm Topics: October 21, 2015

1. Coordinate systems and pixels
   - Be able to use different coordinate systems (origin location, axis orientation, etc)
   - Basics of pixel coloring (RGB) within a coordinate system
   - How this is done in raster for a PPM file
   - Review: Lab 1 (checkboard, odd/even pixel coloring, other simple coloring loops)

2. Lines
   - Line equations (explicit, implicit, parametric)
   - Slopes, line intersections, line segments, etc
   - Line drawing algorithm between two points (what if $|m| > 1$?)
   - Line clipping algorithm
   - Review: HW1, HW4, Lab 2

3. Polygons
   - Convex vs. concave
   - Regular polygons and basic trig (HW2)

4. Fill
   - Flood fill algorithm (recursive), review: Lab 3, Slides 3
   - Sweep fill algorithm for convex polygons (HW2)
   - Basic idea of fill for concave polygons

5. Transformations
   - Rotate, translate, scale, shear, and reflect (last two in less detail)
   - Be able to draw out what a given transformation does
   - 2D matrix form for all transformations above
   - Why do we need 3x3 matrices for some 2D transformations?
   - Matrix multiplication for transformations and their compositions
   - Commuting properties for different combinations of transformations
   - Review: HW3, Transformation notes, Lab 4, Slides 4

6. OpenGL
   - OpenGL workflow
   - 2D points, lines, shapes (all primitives), and coloring them
   - Transformations and animations in OpenGL (HW4)

7. Curves
   - Mathematics of splines and Bézier curves
   - Be able to draw out what curves would look like from control points
   - Recursive definition of Bézier curves

Pair programming partners (random) for Lab 9

- Marina & Emma

- Sophie S. & Kaylynn

- Marissa & Sarah

- Jen & Kassandra

- Zhaoyan & Em

- Bri & Farida

- Laura & Isabel

- Tam & Yvaine

- Grace & Jessica

- Sharon & Sophie H.

- Bianca & Julia

- Stone & Elyse

- Dejia & Chloe