Review

After this video, you should be able to:

• Identify applications of computer graphics
• Distinguish between raster and vector image formats
• Define terms: pixel and image resolution
• Use RGB triplets to represent different colors
• Describe the axis configuration for standard screen coordinates
• Work with points in both pixel center origin and corner origin conventions
Review

After this video, you should know how to:

• Build a basic HTML page that incorporates a graphics canvas
• Identify open/close tag pairs in HTML & check proper nesting
• Define functions and variables in Javascript
• Write simple loops and conditions in Javascript
• Color individual pixels of the graphics canvas in arbitrary colors
Review

After this video, you should know how to:
• Give pseudocode for a simple line algorithm, and implement it if need be
• Given endpoints of a line, determine the proper loop for rendering it
• Carry out by hand the calculations for the simple line algorithm
• Give pseudocode for the midpoint line algorithm
• Explain the advantages of the midpoint algorithm over the simple one
• Define antialiasing and how it applies to drawing lines.
Review

After this video, you should know how to:

• Define simple, complex, convex, and concave polygons
• Compute the center “pizza slice” angle of an $n$-sided regular polygon
• Compute the coordinates of a vertex given the center point and angle
• Draw a sequence of lines in Javascript
• Write a function to draw a regular polygon
Review

After watching this video, you should be able to...

• Define the 2D fill operation
• Determine 4-connected and 8-connected regions
• Design a recursive function with stop condition & simplification
• Implement a recursive 2D fill algorithm
• Pseudocode & simulate a sweep-based 2D fill algorithm
• Explain the advantages of the sweep-based fill.
Review

After watching this video, you should be able to...

• Determine the magnitude and direction of a given vector
• Generate a unit vector from an ordinary vector, or from a 2D angle
• Recognize a matrix and note its dimensions
• Perform both addition and scalar multiplication on matrices and vectors
• Perform and implement matrix multiplication, where possible
• Envision vectors as a combination of unit basis vectors.
Review

After watching this video, you should be able to...

• Define a transformation and describe why they are useful
• Describe 6 major transformation types qualitatively
• Express 6 major transformation types numerically as a matrix
• Convert a regular 2D vector into homogeneous coordinates
• Convert a 2x2 transformation matrix into a 3x3 homogenous equivalent
• Compose transformations by multiplying their matrices
Review

After watching this video, you should be able to...

• List three types of coordinate systems used in graphics
• Describe the transforms used to relate the different coordinate systems
• Recognize that the same effect can be achieved through either transform
• Know how the current transform affects objects added to a scene
• Manipulate the current transform to achieve desired effects
• Understand that transforms accumulate through object part hierarchies
Review

After watching this video, you should be able to...

• Define a Bézier curve of any order
• Compute the point on a Bézier curve at position $t$.
• Define a spline curve and give two example types
• Identify the necessary conditions for a Bézier spline to be smooth
• Construct a cubic spline given control points & a polynomial curve fitter
• Recognize other applications of splines
Review

After watching this video, you should be able to...

• Explain the motivation for line clipping
• Compute Cohen-Sutherland endpoint codes, given a point & viewport
• Use the codes to determine whether a segment is visible, and/or whether clipping is required
• Clip line segments as needed according to the viewport boundaries
• Demonstrate the Sutherland-Hodgman polygon clipping algorithm by hand
Breakout Prompts

1. What topic(s) have you enjoyed most so far in this class, and why?

2. What topic(s) have you found most confusing, and why?

3. What strategies have you found most useful for success in this class so far? What would you recommend to others?

4. (Optional) What lingering questions do you still have?