Review: Perspective

- **Perspective** is the theory that allows you to draw or paint so that (if you look from exactly the right point), looking at the result follows optical rules in exactly the same way that an actual photograph does.

- **One Point Perspective** is the technique for dealing with situations where some or most of the lines which are **not** parallel to the picture plane are in fact **orthogonal** (perpendicular) to it.

  Some people say **all** such lines must be orthogonal to the picture plane; others say if there are *any* orthogonal lines, it's in one point perspective.

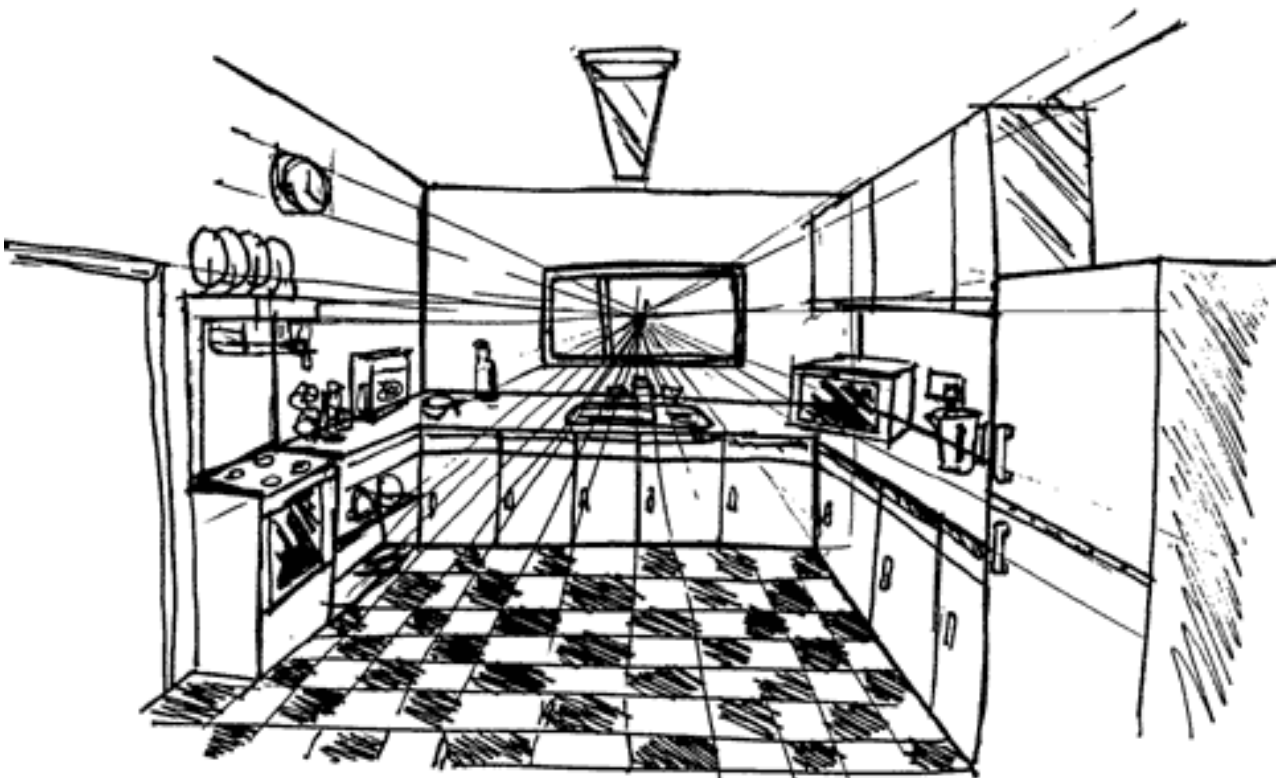
  I expect that what really matters is how the *bulk* of the lines are oriented, which will determine where your eyes are drawn.

One Point Perspective

This picture consists almost entirely of lines which are either parallel to the picture plane (the uprights of the fence, and the crossbars which from the front) or lines which are **orthogonal** to the picture plane (the crossbars that are orthogonal to the front of the fence). Because it contains (many) lines which are orthogonal to the picture plane, it is in **one-point perspective**.

However, while the uprights in the gate are still parallel to the picture plane, the crossbars in the gate are **neither parallel nor orthogonal to the picture plane**.

One Point Perspective

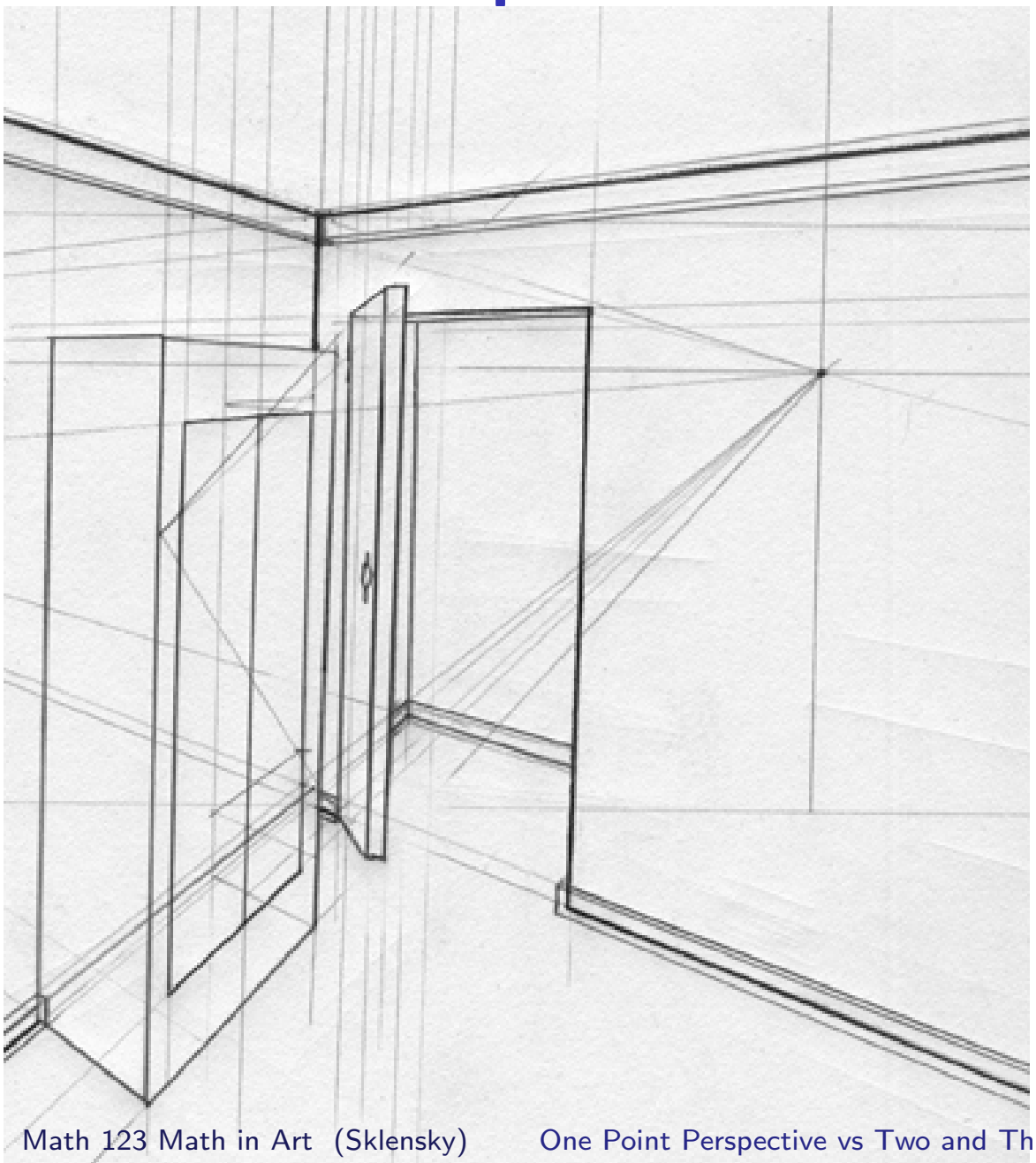


Again, most lines are either parallel to the picture plane, or are **orthogonal** to it (top and bottom edges of side walls, top of door frame, top of refrigerator, bottom or top of cabinets on side walls, side edges of tiles, etc).

However, the microwave on the corner of the countertop is oriented so that while its vertical edges are still parallel to the picture plane, its horizontal edges are neither parallel to nor orthogonal to the picture plane.

Two Point Perspective

Two Point Perspective



Three Point Perspective

Three Point Perspective

Idea: Vanishing Points of Orthogonals

If the artist's assumed viewer is looking at points farther and farther back along an orthogonal, his/her lines of sight will get closer and closer to being parallel to that orthogonal (and hence, to *all* orthogonals).

If the viewer were able to look all the way infinitely out along the line, the line of sight would be parallel to the orthogonal (and hence, would itself be orthogonal to the picture plane). Infinity is the farthest out the line can go (in fact, it really can't go that far), and so the orthogonal line of sight is the most extreme line of sight to the orthogonal possible.

Hence if you want to draw an infinitely long orthogonal, the perspective image will actually **end** –where the line of sight from the viewer is orthogonal to the picture plane.

In other words, infinitely long orthogonals end, or **vanish**, at the point on the picture plane directly opposite the artist's assumed position for the viewer – our origin.

Vanishing Points

A **Vanishing Point** for a line is the point where the perspective image of an infinitely long line ends – where the assumed viewer (with eye located on the negative z-axis) would be looking at the infinite end of the line. The vanishing point has nothing to do with curvature of the earth.

If an infinitely long line is extending away from you in any way, then as you look at points further and further along the line, your line of sight becomes closer and closer to parallel to the line you're looking at. The only way to "see" to infinity on the line is for the line of sight to be parallel to the line (in which case, in fact, the viewer can't see any finite portion of the line).

We will see in detail which types of lines *have* vanishing points and which do not, and for those that *do* have them, we will see that they occur when lines of sight are parallel to the line being represented.

Vanishing Point Theorem, Part 1:

Theorem: The perspective images of **all** lines orthogonal to the picture plane share a single *vanishing point*; that point is at the origin, i.e. directly opposite the viewer's eye.

Conclusion: If you're looking at a picture that contains perspective images of lines orthogonal to the picture plane, you should place your eye directly opposite that vanishing point to get the greatest sense of depth.