

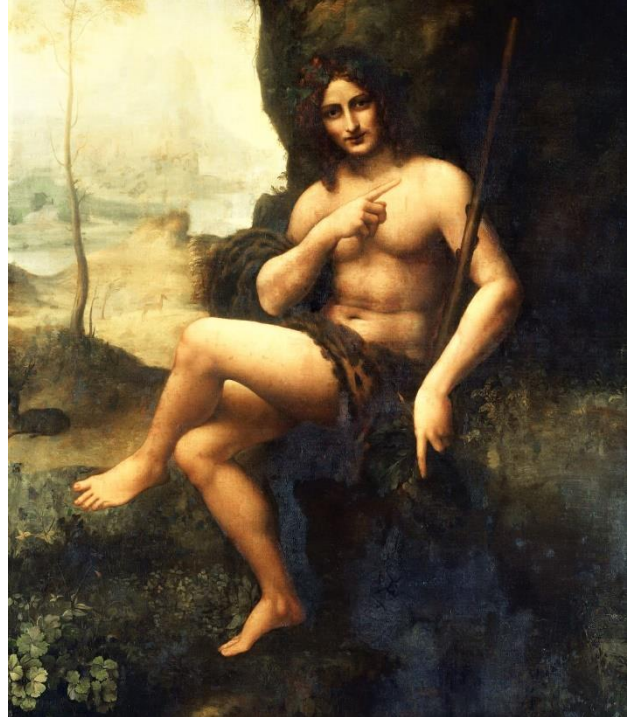
Hexagonal Geometry in Art History

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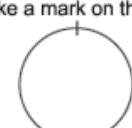



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In 2005 I came across this picture (detail) by Leonardo in a book. This was at the height of the *Da Vinci Code* frenzy, so it got me thinking. Can you guess what is going on here?



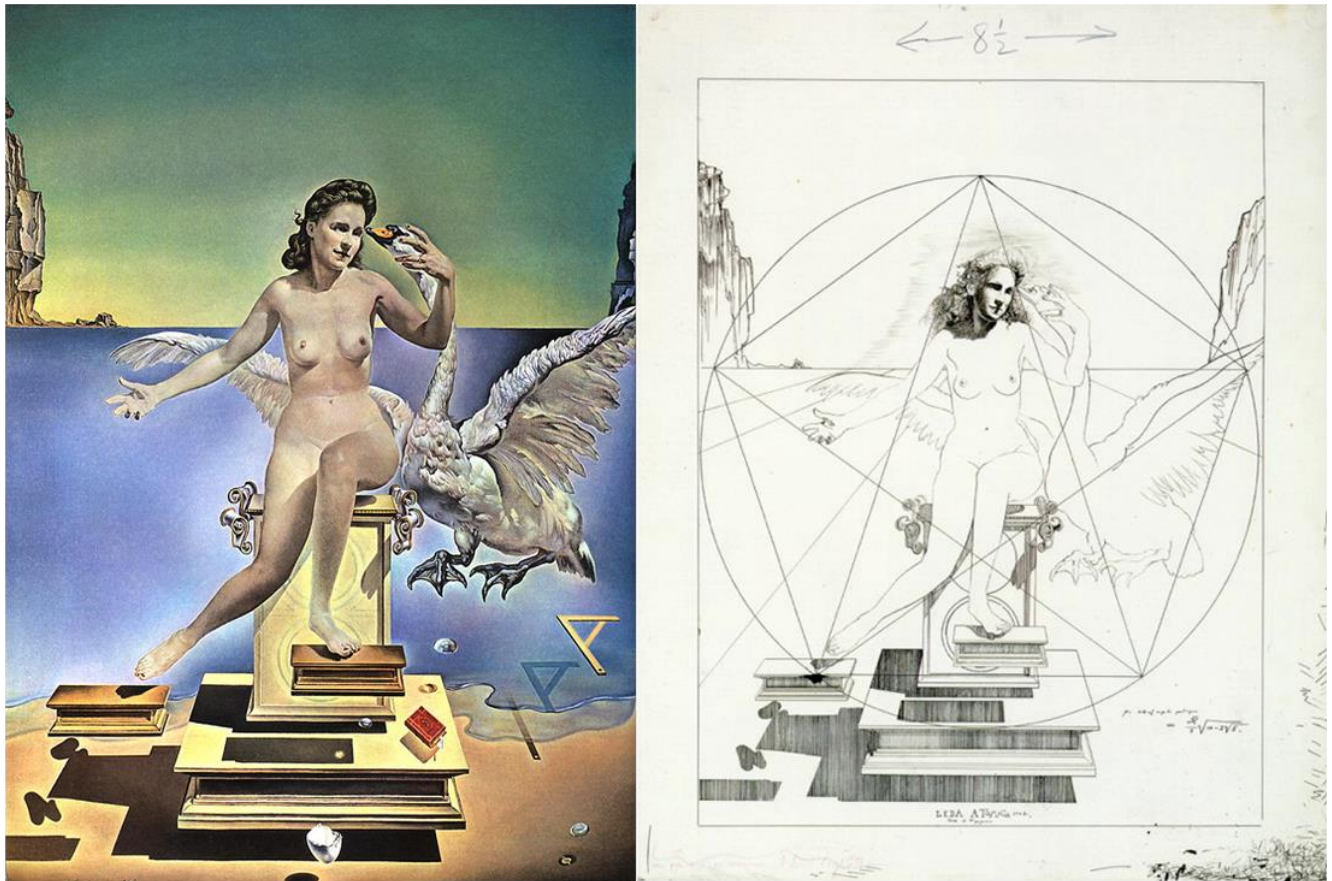
It only takes two points to indicate a hexagon grid. This compass is at the Rembrandt House Museum.



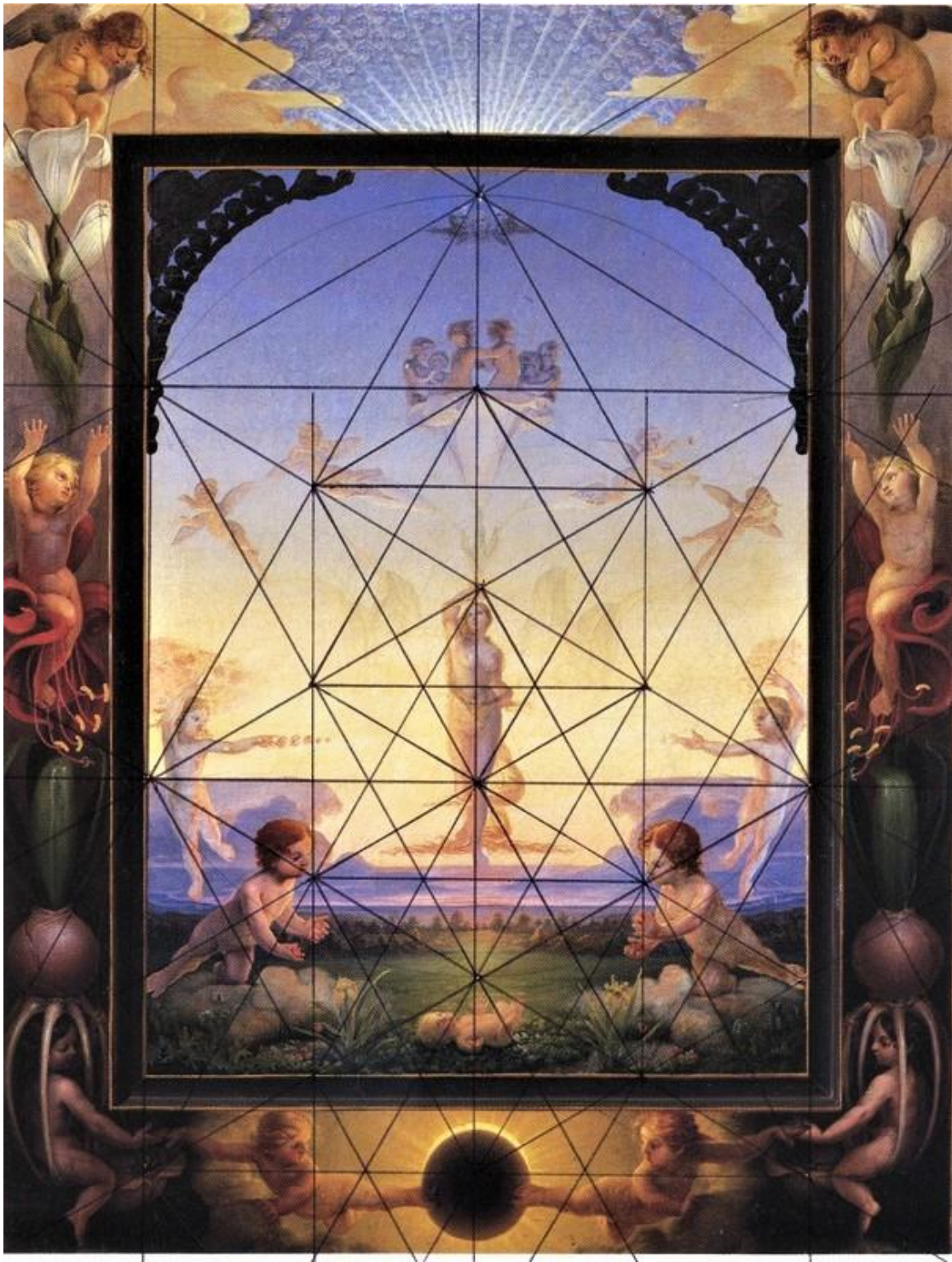
1. Select the length of a side.

2. Set the compass to that length.

3. Draw a circle with the compass.

4. Make a mark on the circle.

5. Starting at the mark, swing a series of arcs around the circumference of the circle.

6. Check to make sure that the last mark lands directly on the first one. If not, repeat step 5.

7. Connect the marks with straight lines to form a hexagon.


So I tried it; hardly conclusive, but the left foot was suggestive, so I started looking for paintings with people pointing. In *Fifty Secrets of Magic Craftsmanship*, Salvador Dali talks about using large compasses:

As I do not wish you to spend days and killing hours which you might devote to painting at your mathematical calculations, I shall now reveal to you the secret of the compass – and this is Secret Number 47 – by means of which you will be able automatically to find as many golden sections as you wish, without having recourse to the painful geometric operation for which you often need an immense compass, requiring that you go beyond the area of your painting, and this is often so inconvenient that your laziness will counsel you at last to get along without such a proportion... And the fact that such compasses are not currently for sale at paint dealers is but the proof of the lack of geometric rigor of schools of art, and of modern painters in particular.



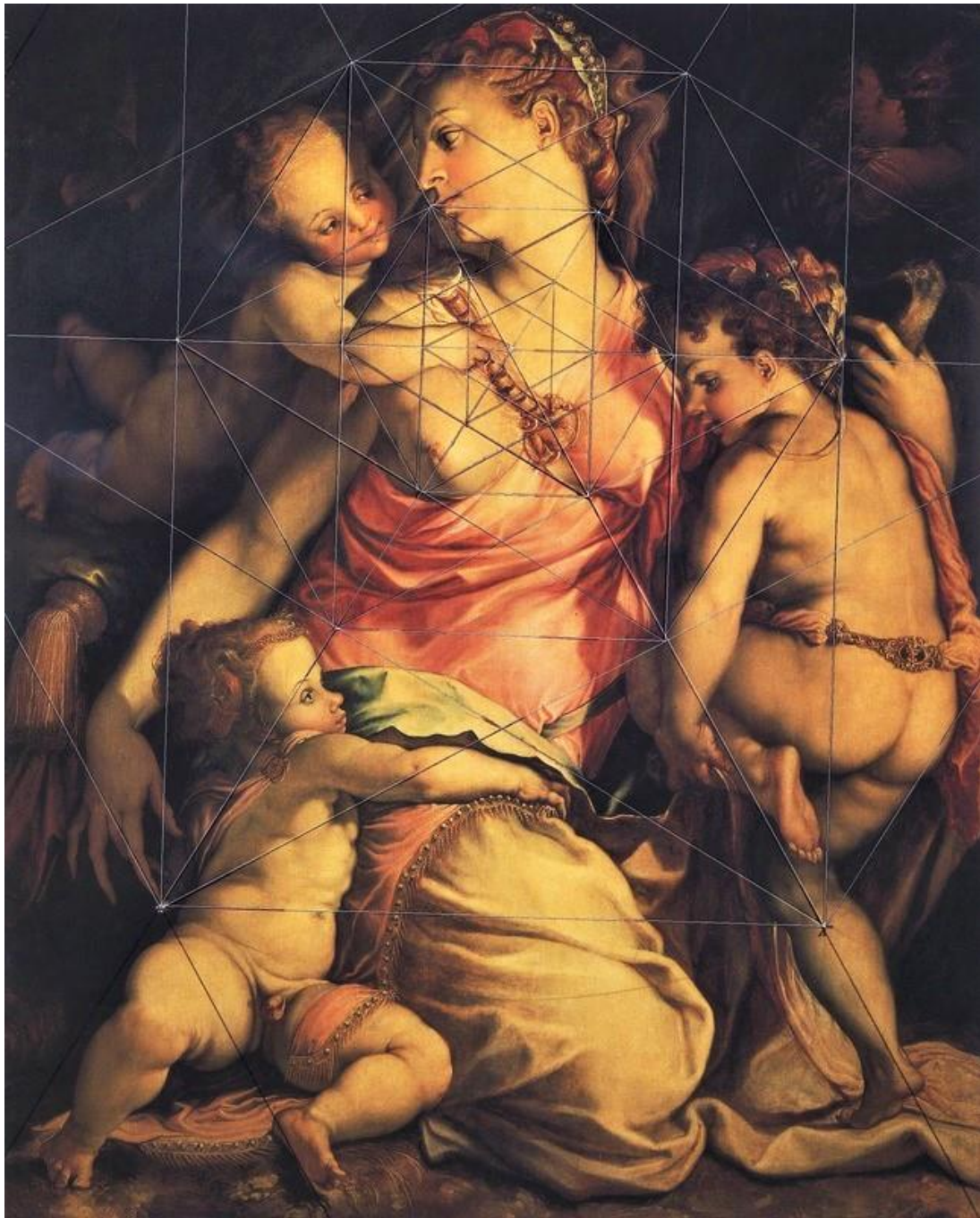
Leda Atomica; this one is a pentagon, not a hexagon, but it shows his approach.



Philip Otto Runge, *Morning*, 1808. There is a small star, or presumably Venus, obscured by lines that was the second point used to get the grid.

This is Odd Nerdrum; I contacted his son and asked about the geometry of two paintings, he came back with "yes."





Francesco Salviati, *Charity* (1544-48). Note the eye-in-the-triangle motif.



Dürer, *Knight, Death and the Devil* (1513); it's only about 9 ½ inches tall, remarkable for an engraving. There is a small lizard in the lower right-hand corner, that and the knight's index finger were the two points I used, and they happen to lay a grid that's perfectly oriented.

Considering, however, that this is the true foundation for all painting, I have proposed myself to propound the elements for the use of all eager students of Art, and to instruct them how they may employ a system of Measurement with Rule and Compass, and

thereby learn to recognize the real Truth, seeing it before their eyes. – Albrecht Dürer, *The Painter's Manual* (1525)

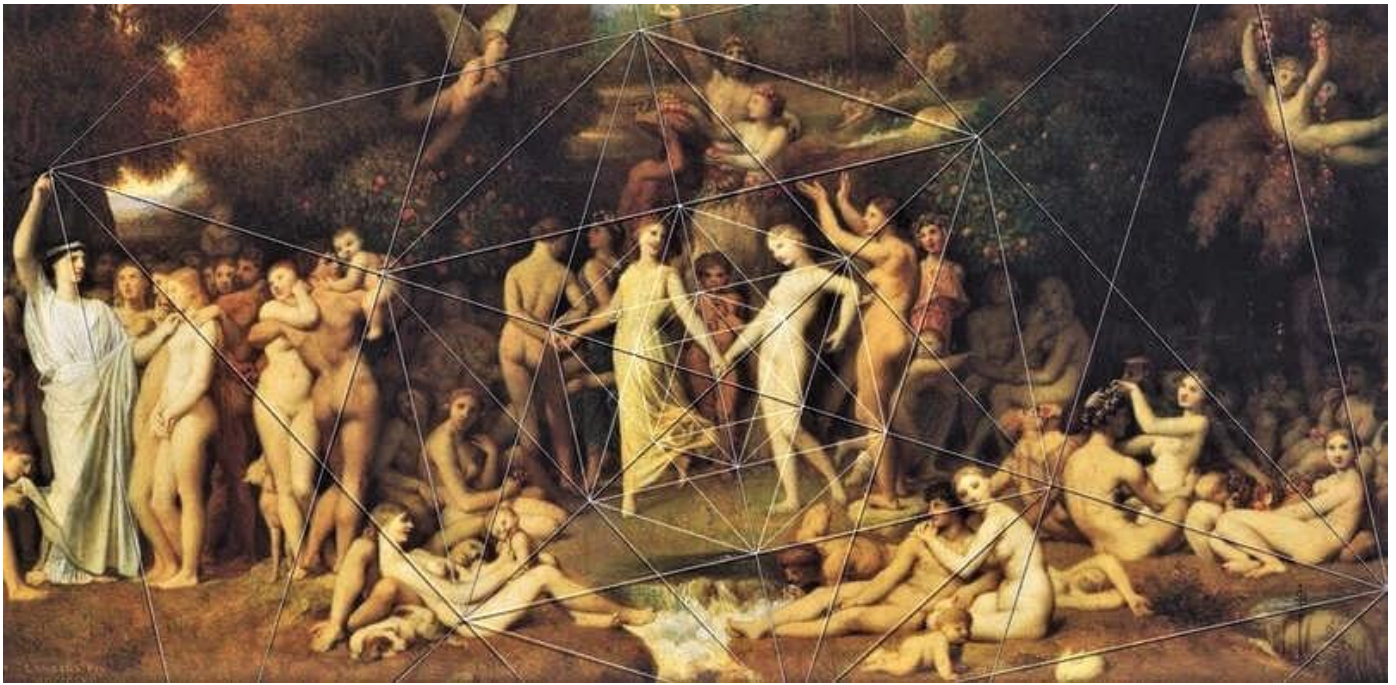
Michelangelo thought Dürer's reliance on geometry excessive, and is reported by Vasari to have said "It is necessary to keep one's compass in one's eyes and not in the hand, for the hands execute, but the eye judges."



Unknown artist, Florence

Charles Bouleau, *The Painter's Secret Geometry*:

In the Middle Ages the 'geometry' of a work of art, whether picture, bas-relief or page of manuscript, consisted chiefly in the use of the regular polygons as an armature, as an interior framework, figures that were sometimes quite complicated, with five, six, or eight sides, not forgetting the double figures formed by the star pentagons and hexagons.



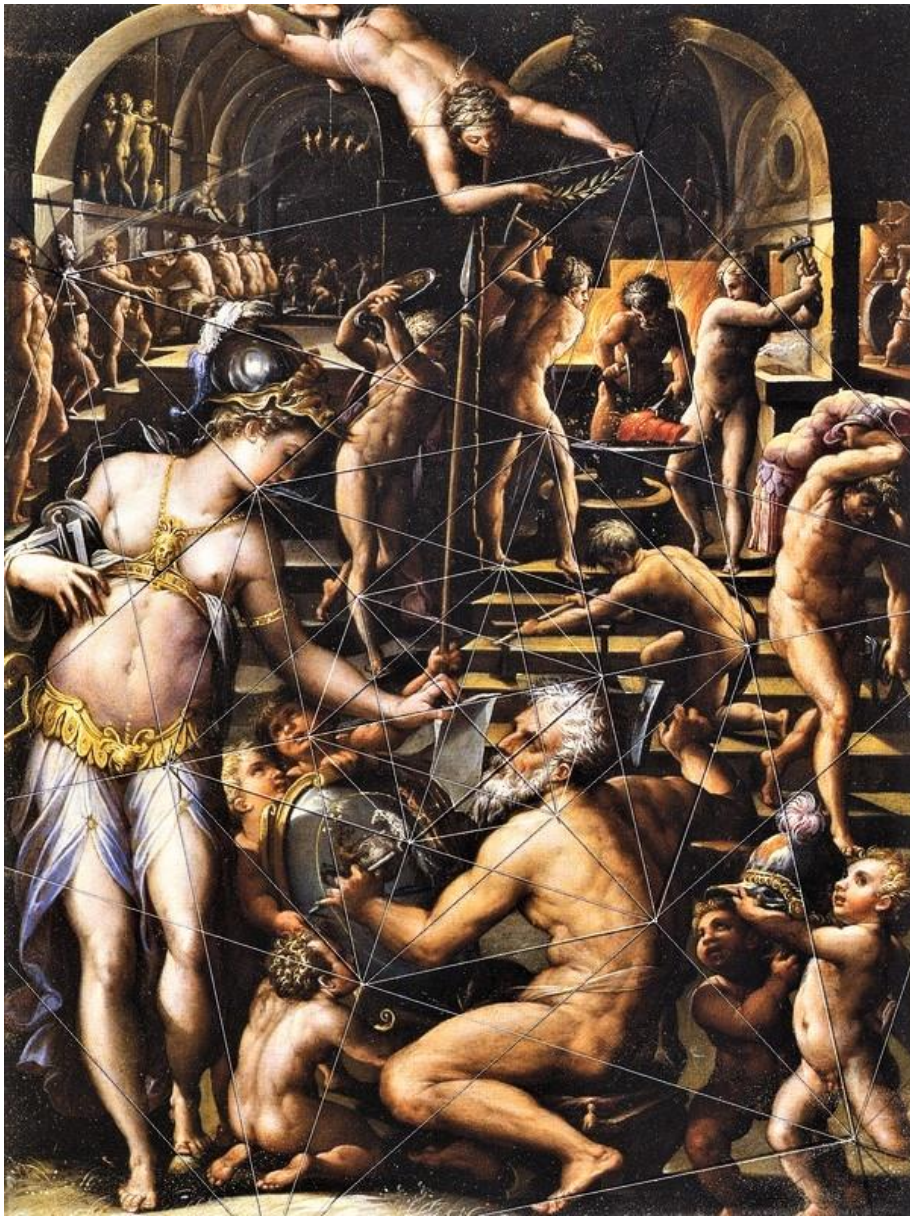
The Golden Age (detail) (1862), Ingres. "I began from the background, with the architecture. Once the lines were marked out, I called all my figures, one by one, and they came obediently to take their places in the perspective." Charles Blanc, quoting Ingres in *Ingres, sa vie et ses ouvrages*, Paris 1870



Raphael, *School of Athens* (detail) (1509-11)

When you want to draw on a wall, first level the surface and then attach pieces of wood to the legs of a pair of metal compasses, to make them as long as you want, and tie a brush to one end so that you can mark with color the proportions of the figure and describe their halos. When you have marked the proportions of the figure, take some ochre and draw first with a watery solution. — Dionysius of Fournia, *Painter's Manual*

With larger paintings, I wondered how it was done, and realized all that's necessary is a piece of string and chalk; the radius is the same as the distance between the points, it's really easy, you would just chalk up the string and snap it on the canvas, probably on the floor, to get a grid.



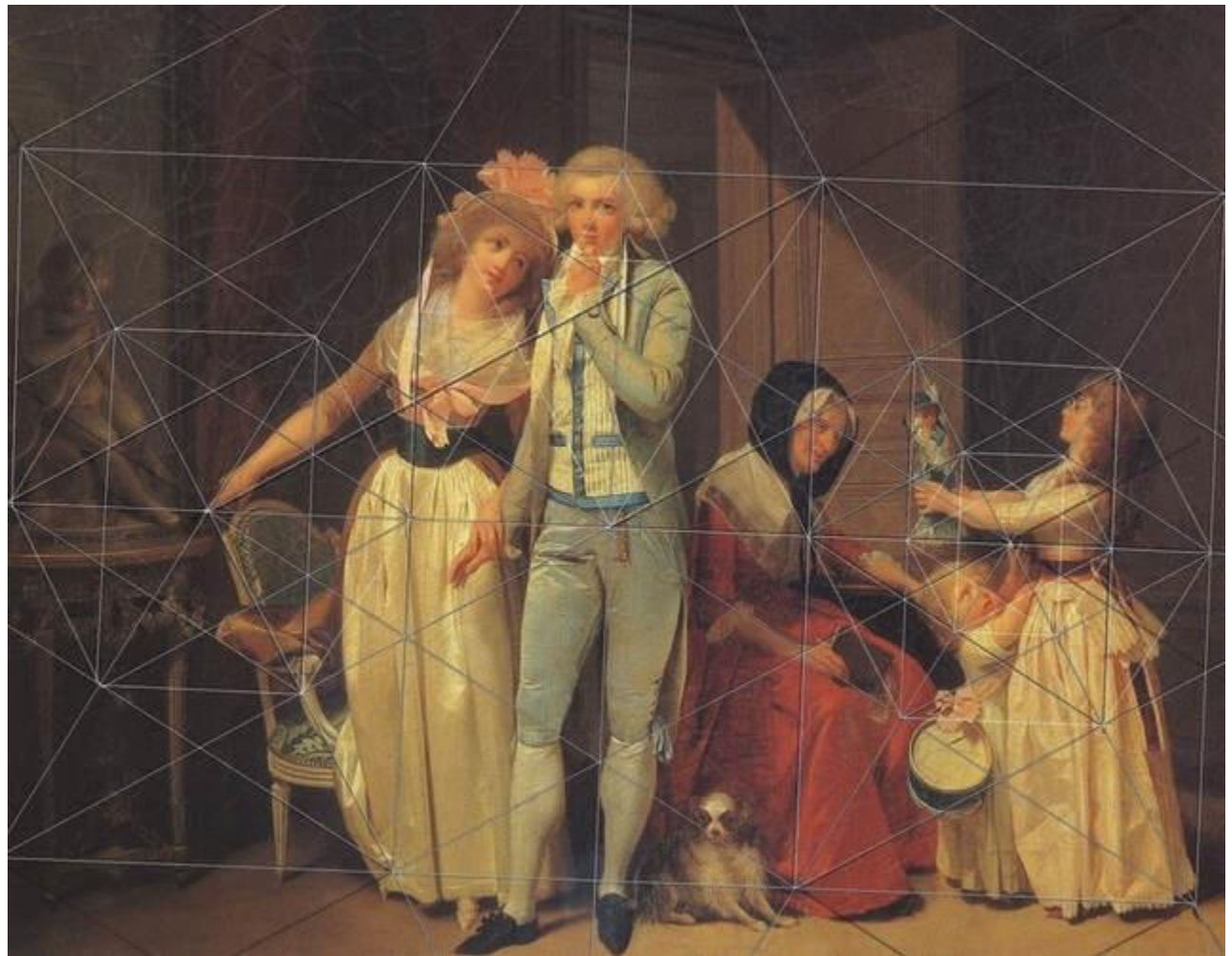
Giorgio Vasari, *Forge of Vulcan*



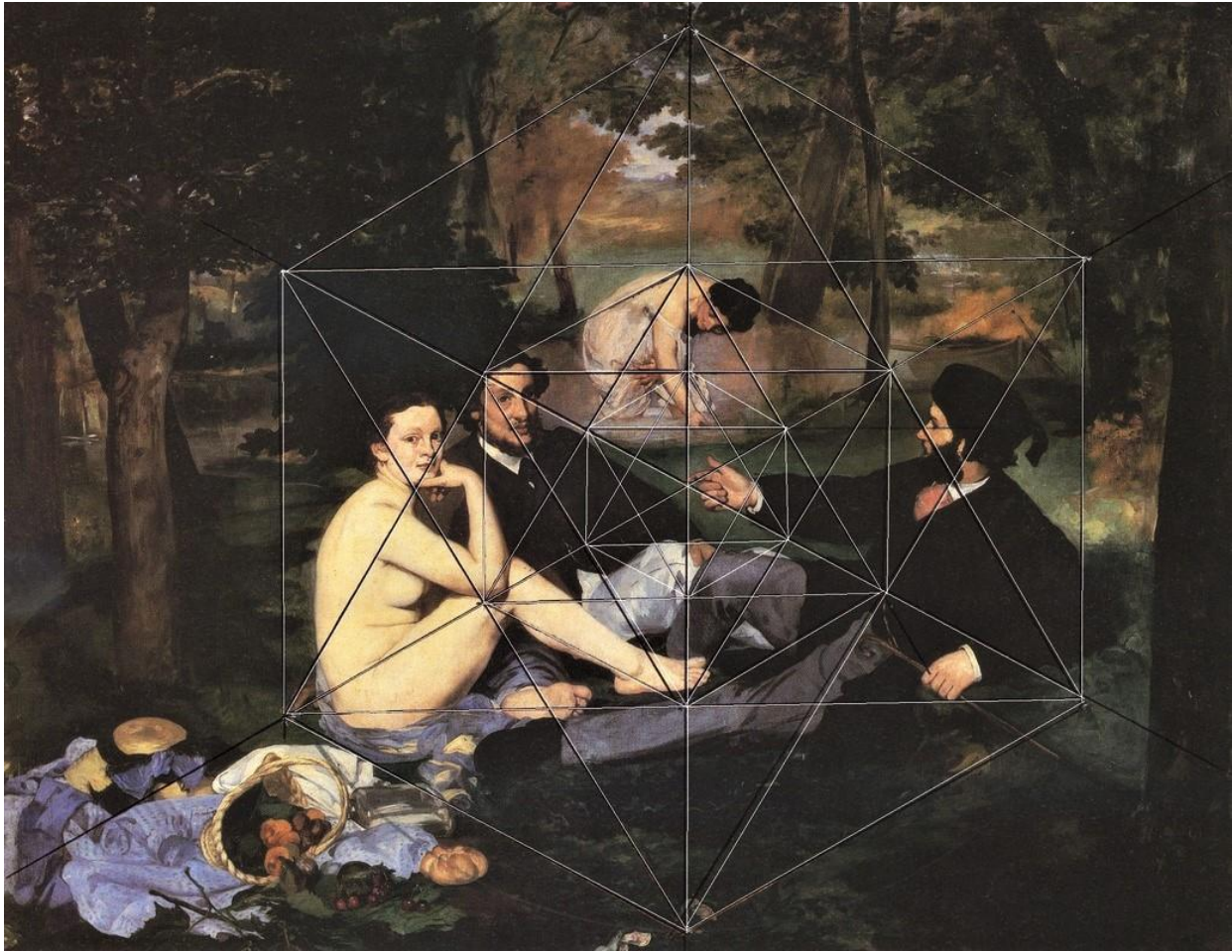
Venus doing her thing, Guercino



Holy Family with Mary Magdalene, Palma Vecchio



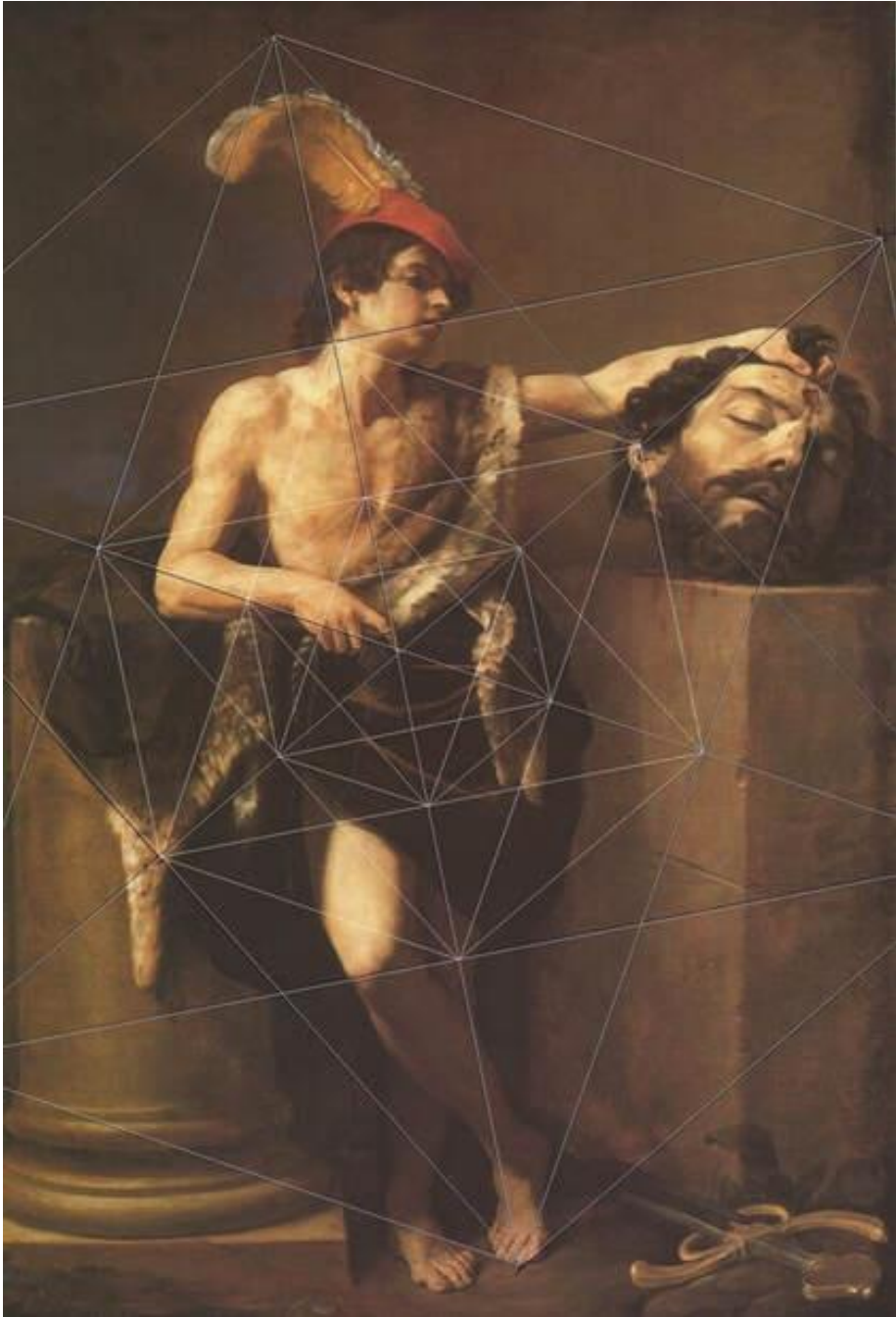
The Young Philosopher, Boilly. He's not sure about this family business with the baby and drum. Eye-in-the-triangle.



Le Déjeuner sur l'herbe, Édouard Manet (1862-63)



Pontormo



Guido Reni