

MATH 121

(Day 6)

Piero della Francesca's Diagonal Construction



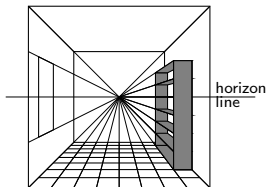
Richard Hammack:

www.people.vcu.edu/~rhammack/Math121/

Two Types of Perspective

Two Types of Perspective

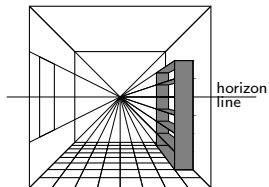
One-point perspective



(Viewer faces object(s) straight-on)

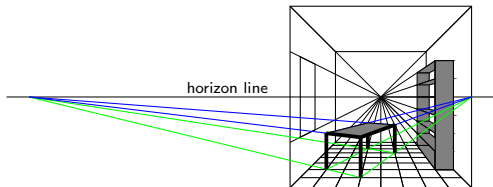
Two Types of Perspective

One-point perspective



(Viewer faces object(s) straight-on)

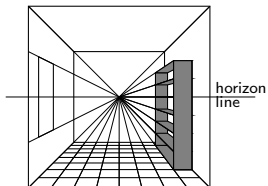
Two-point perspective



(Viewer faces object(s) at an angle)

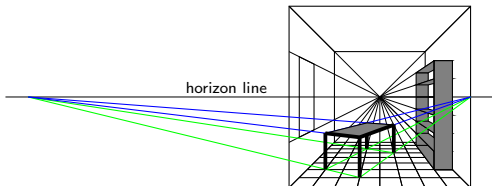
Two Types of Perspective

One-point perspective



(Viewer faces object(s) straight-on)

Two-point perspective

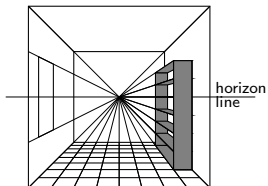


(Viewer faces object(s) at an angle)

Problems of two-point perspective:

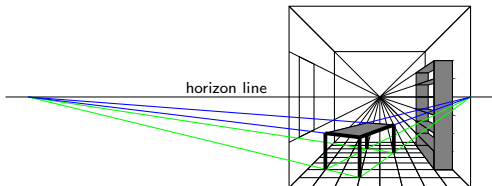
Two Types of Perspective

One-point perspective



(Viewer faces object(s) straight-on)

Two-point perspective



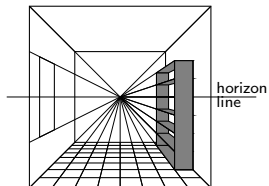
(Viewer faces object(s) at an angle)

Problems of two-point perspective:

- ▶ How do you locate multiple vanishing points?

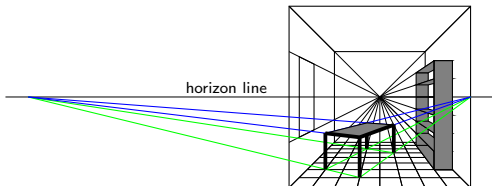
Two Types of Perspective

One-point perspective



(Viewer faces object(s) straight-on)

Two-point perspective



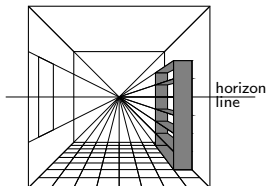
(Viewer faces object(s) at an angle)

Problems of two-point perspective:

- ▶ How do you locate multiple vanishing points?
- ▶ What if one or more vanishing points lie off your paper?

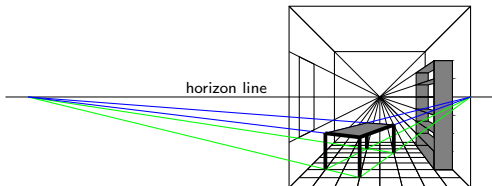
Two Types of Perspective

One-point perspective



(Viewer faces object(s) straight-on)

Two-point perspective



(Viewer faces object(s) at an angle)

Problems of two-point perspective:

- ▶ How do you locate multiple vanishing points?
- ▶ What if one or more vanishing points lie off your paper?

Today's Goal: Examine the art and mathematics of Piero della Francesca; Learn how he overcame these problems.

Piero della Francesca



1415–1492



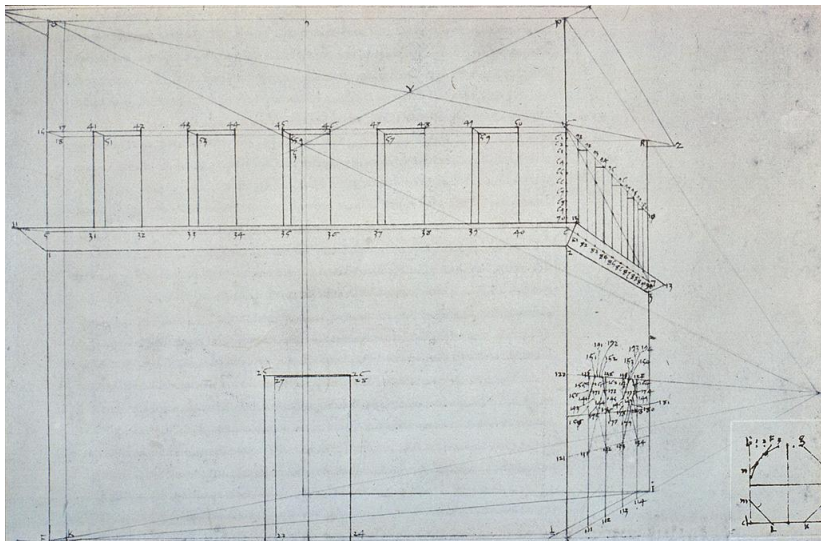
Piero della Francesca, *Madonna di Senggallia*, c. 1473



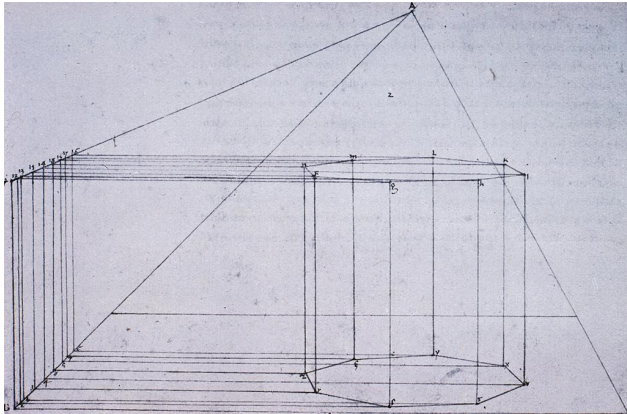
Piero della Francesca, *Legend of the True Cross: Annunciation*, c. 1453



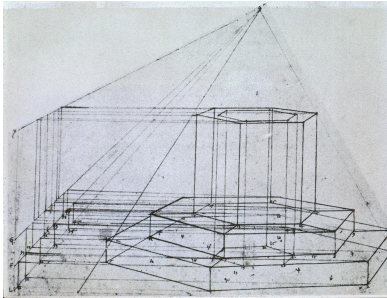
Piero della Francesca, *St. Anthony Polyptych; Annunciation*, c. 1465

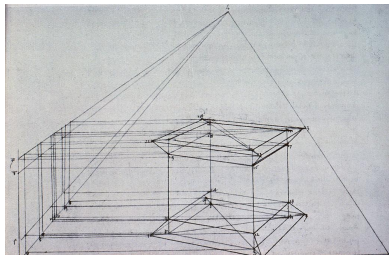
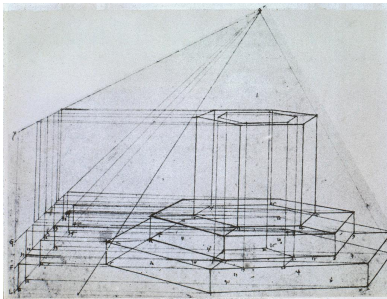


From Peiro's book *On Perspective for Painting*, c. 1475

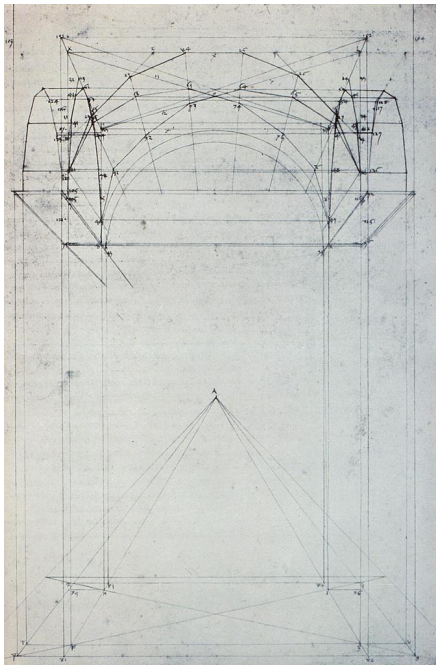


From Peiro's book *On Perspective for Painting*, c. 1475





From Peiro's book *On Perspective for Painting*, c. 1475

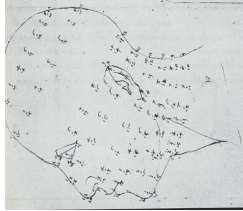


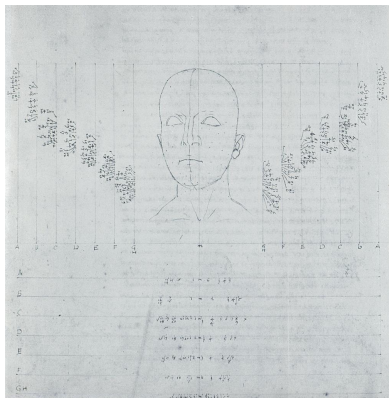
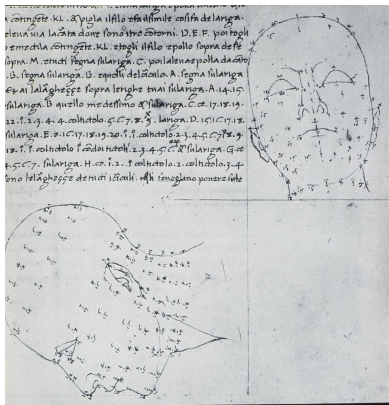
delago nella cartongere p. de la dange adone colabala q. fa p. nel lango
 cartongere r. e. r. ad la dange adone colabala q. p. n. a. r. de colabala x. figura
 a. una lango cartongere q. e. p. de la dange adone colabala q. p. n. a. r. de
 colabala q. lango q. adone colabala q. r. e. r. ad la dange adone colabala
 q. p. n. a. r. de colabala q. lango q. adone colabala q. r. e. r. ad la dange
 adone colabala q. p. n. a. r. de colabala q. lango q. adone colabala q. r. e. r.
 ad la dange adone colabala q. p. n. a. r. de colabala q. lango q. adone
 colabala q. r. e. r. ad la dange adone colabala q. p. n. a. r. de colabala
 q. lango q. adone colabala q. r. e. r. ad la dange adone colabala q. p. n.
 a. r. de colabala q. lango q. adone colabala q. r. e. r. ad la dange adone
 colabala q. p. n. a. r. de colabala q. lango q. adone colabala q. r. e. r. ad
 la dange adone colabala q. p. n. a. r. de colabala q. lango q. adone colabala
 q. r. e. r. ad la dange adone colabala q. p. n. a. r. de colabala q. lango
 q. adone colabala q. r. e. r. ad la dange adone colabala q. p. n. a. r. de
 colabala q. lango q. adone colabala q. r. e. r. ad la dange adone colabala
 q. p. n. a. r. de colabala q. lango q. adone colabala q. r. e. r. ad la dange
 adone colabala q. p. n. a. r. de colabala q. lango q. adone colabala q. r. e.
 r. ad la dange adone colabala q. p. n. a. r. de colabala q. lango q. adone
 colabala q. r. e. r. ad la dange adone colabala q. p. n. a. r. de colabala
 q. lango q. adone colabala q. r. e. r. ad la dange adone colabala q. p. n.



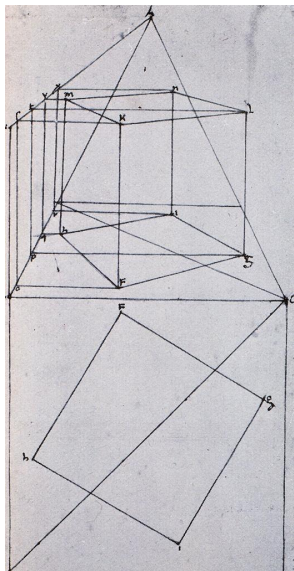
A	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
B	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
C	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
D	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
E	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
F	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
G	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
H	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30

Continget. Kl. & piglia il filo sopra il limite casta del aringa
 et una sua la zeta done sono tre coroni. D. E. F. poi togl
 et medita continget. Kl. etogli il filo sopra de fe
 sopra. M. etudi sopra fulariga. C. poi la tena sopra da sito
 B. sopra fulariga. B. equidi del d'acolo. A. sopra fulariga
 et ai l'alighesse sopra lenche mai fulariga. A. 14. 15.
 fulariga. B. quello medesimo a fulariga. C. et. 17. 18. 19.
 22. 1. 2. 3. 4. col hoto. 5. 6. 7. 8. 9. lenza. D. 15. 17. 18.
 fulariga. E. 7. 11. 17. 18. 19. 20. 1. col hoto. 2. 3. 4. 5. 6. 7. 8. 9.
 12. 1. 1. col hoto. 1. col hoto. 2. 3. 4. 5. 6. 7. fulariga. G. et
 6. 5. 6. 7. fulariga. H. et. 1. 2. 1. col hoto. 2. col hoto. 3. 4.
 sono l'alighesse de hici i zanki. et li tenogano ponete site

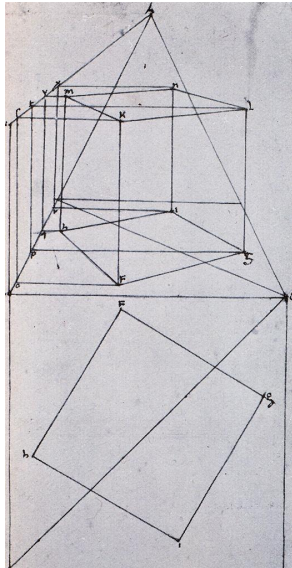




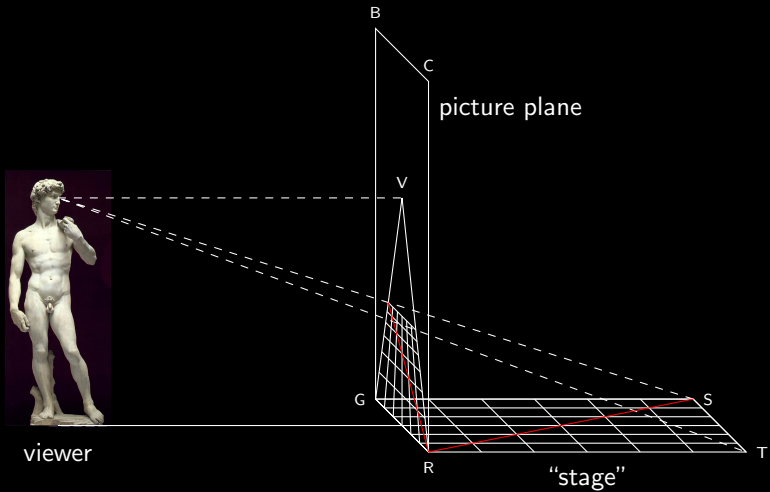
From Peiro's book *On Perspective for Painting*, c. 1475



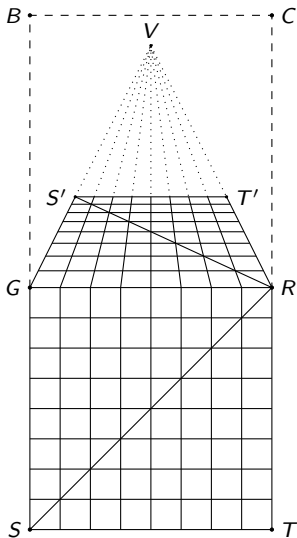
Piero della Francesca's Diagonal Construction



Piero della Francesca's Diagonal Construction

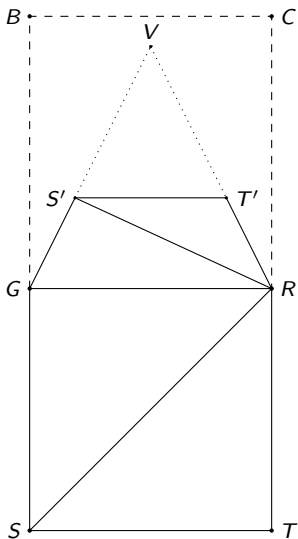


Piero's floorplan and its perspective view

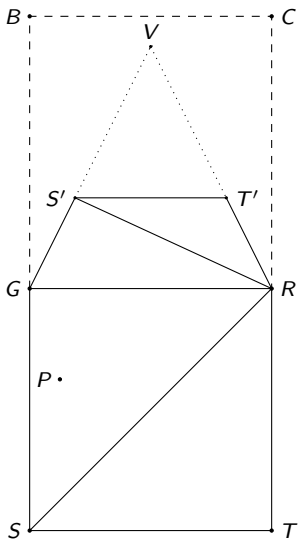


A “stage” on which to create a scene

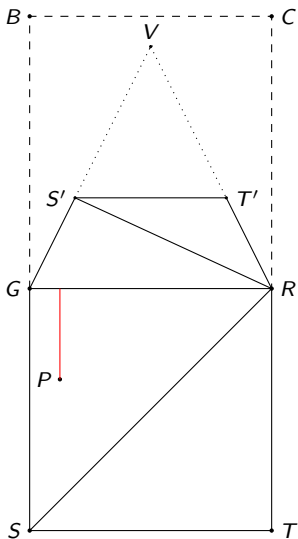
How to locate the perspective image P' of a point P



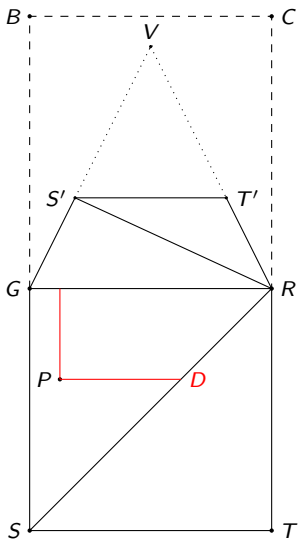
How to locate the perspective image P' of a point P



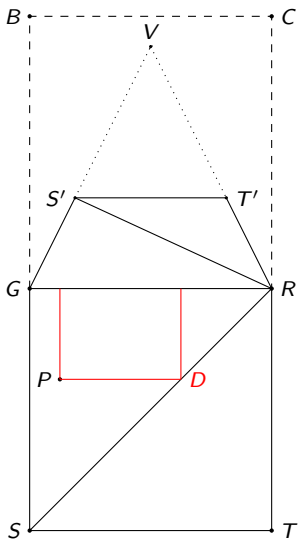
How to locate the perspective image P' of a point P



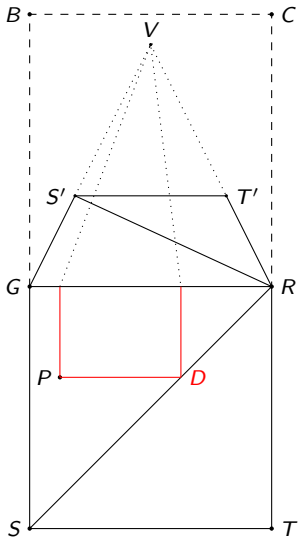
How to locate the perspective image P' of a point P



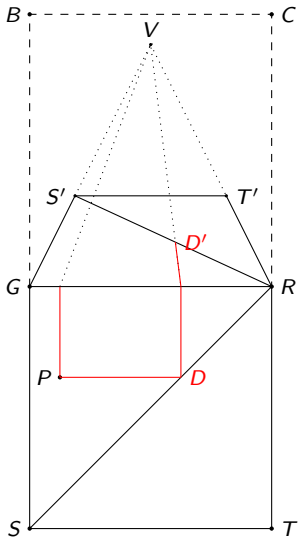
How to locate the perspective image P' of a point P



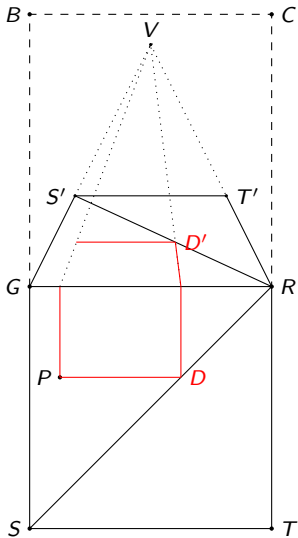
How to locate the perspective image P' of a point P



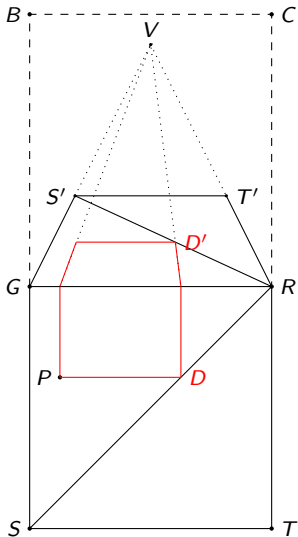
How to locate the perspective image P' of a point P



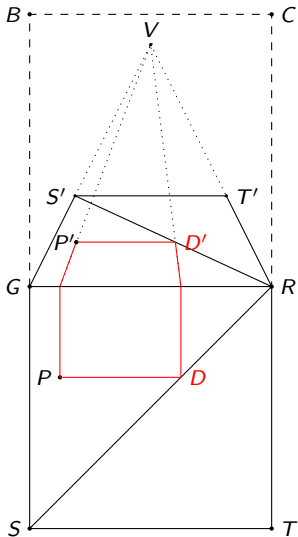
How to locate the perspective image P' of a point P



How to locate the perspective image P' of a point P

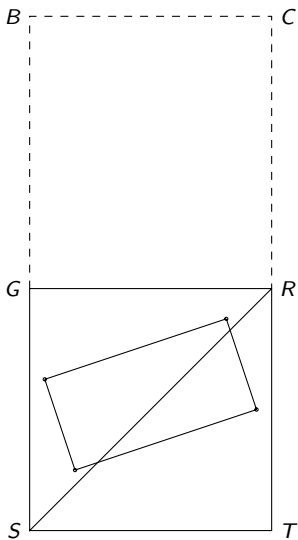


How to locate the perspective image P' of a point P

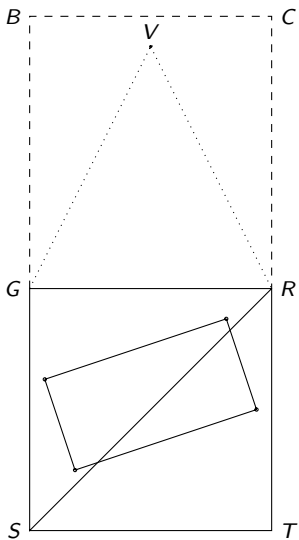


Drawing a box in perspective

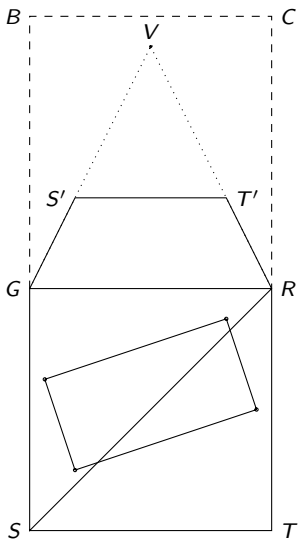
Drawing a box in perspective



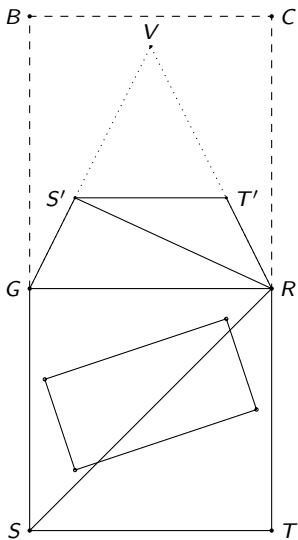
Drawing a box in perspective



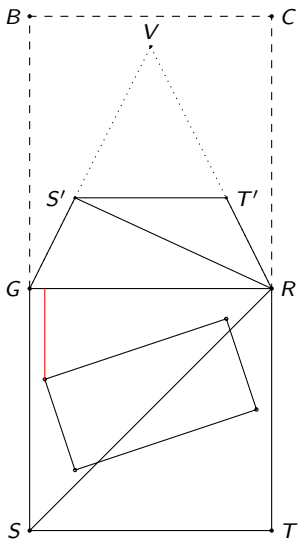
Drawing a box in perspective



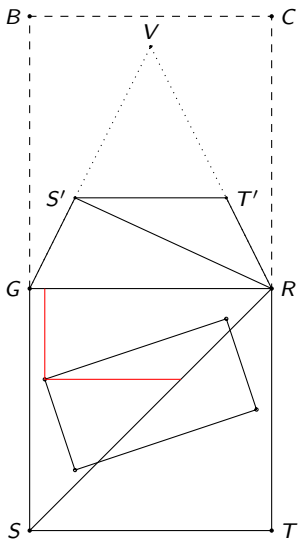
Drawing a box in perspective



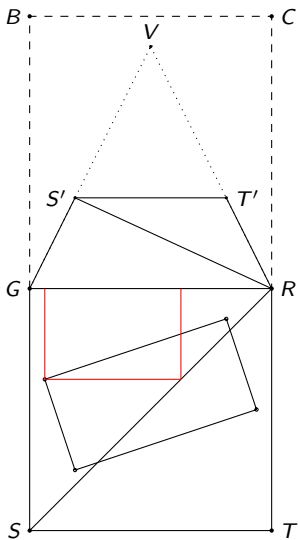
Drawing a box in perspective



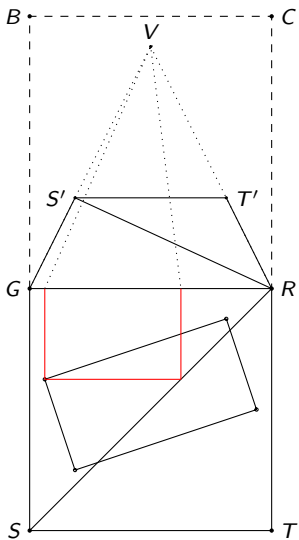
Drawing a box in perspective



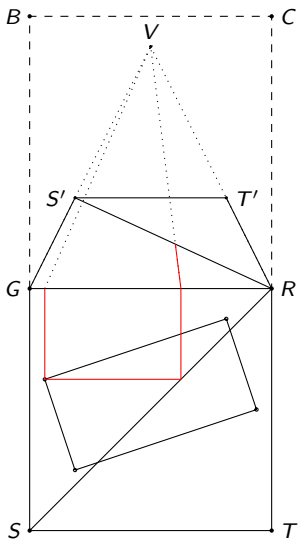
Drawing a box in perspective



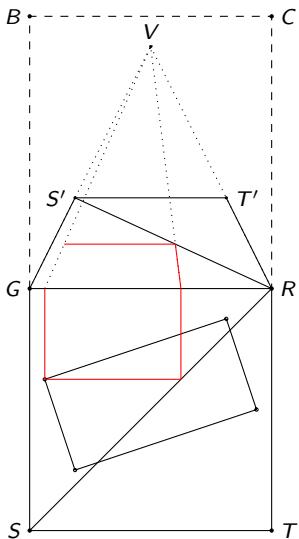
Drawing a box in perspective



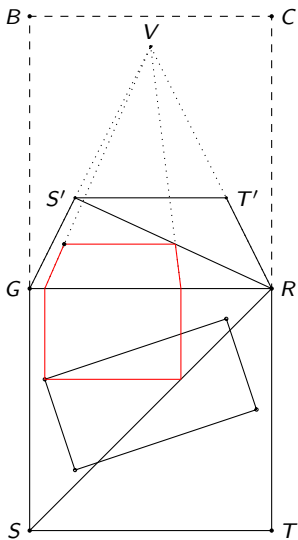
Drawing a box in perspective



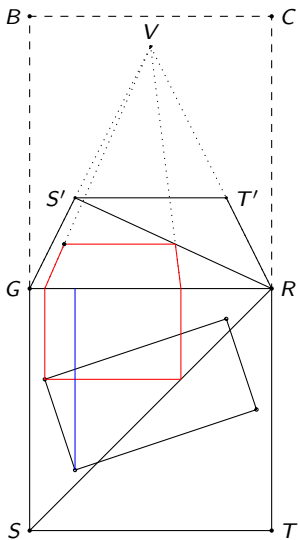
Drawing a box in perspective



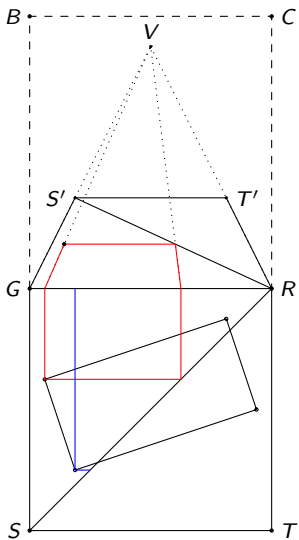
Drawing a box in perspective



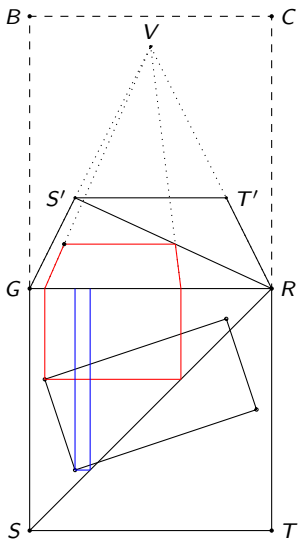
Drawing a box in perspective



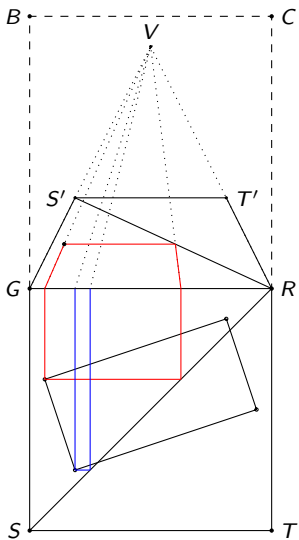
Drawing a box in perspective



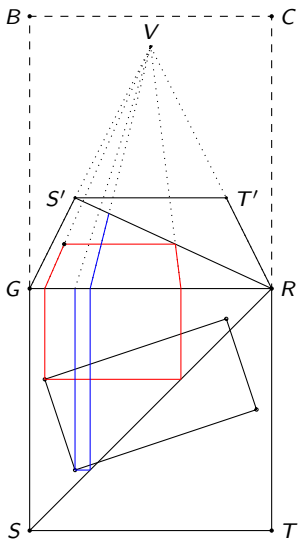
Drawing a box in perspective



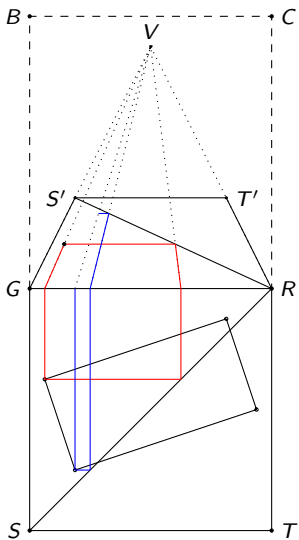
Drawing a box in perspective



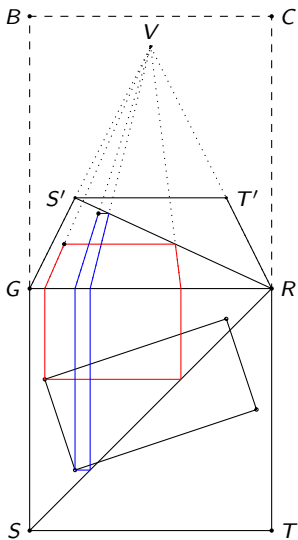
Drawing a box in perspective



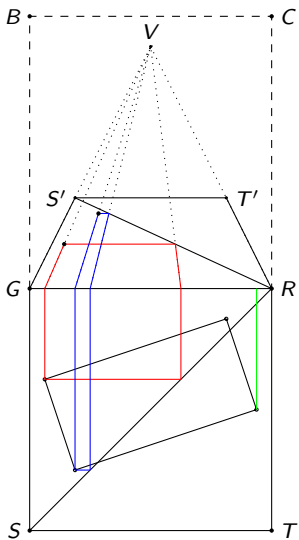
Drawing a box in perspective



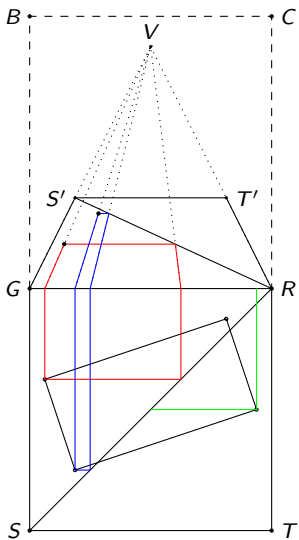
Drawing a box in perspective



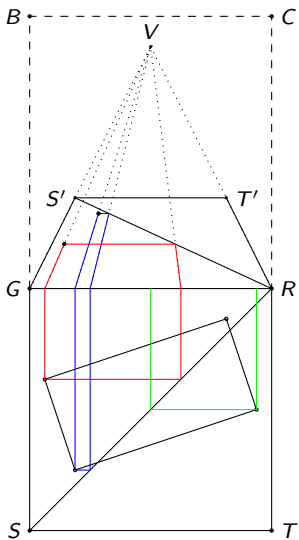
Drawing a box in perspective



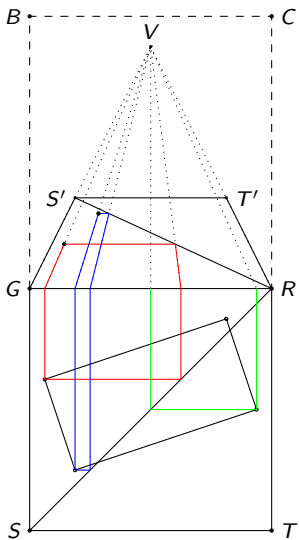
Drawing a box in perspective



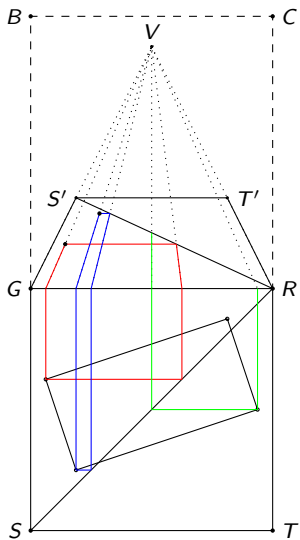
Drawing a box in perspective



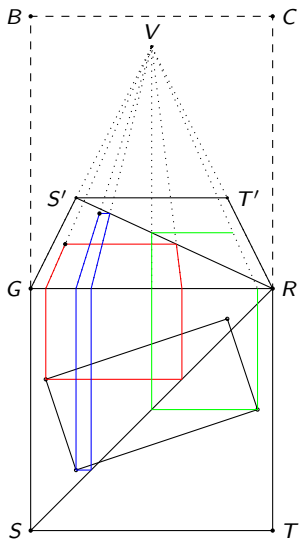
Drawing a box in perspective



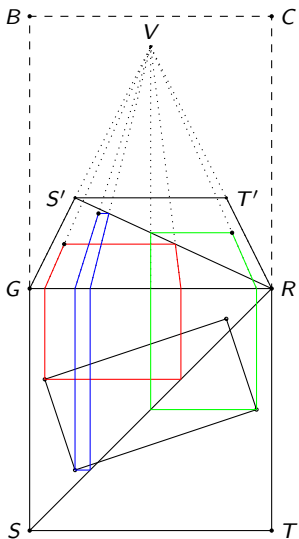
Drawing a box in perspective



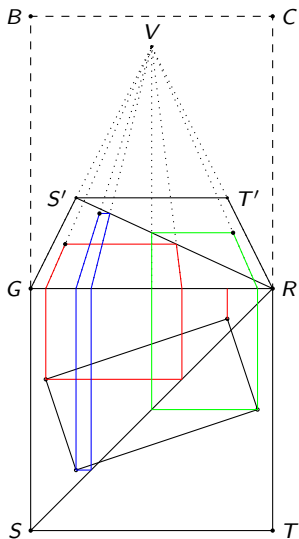
Drawing a box in perspective



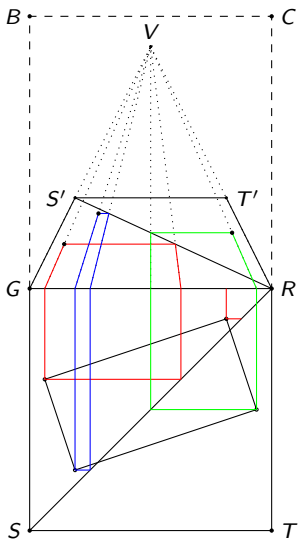
Drawing a box in perspective



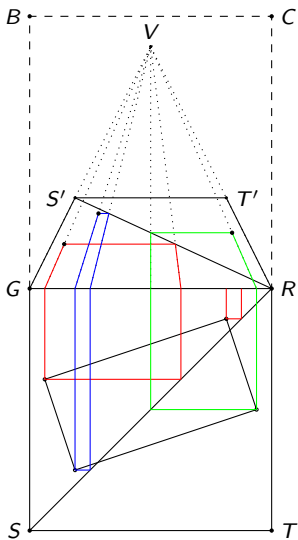
Drawing a box in perspective



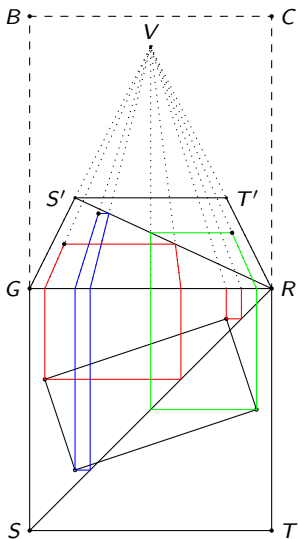
Drawing a box in perspective



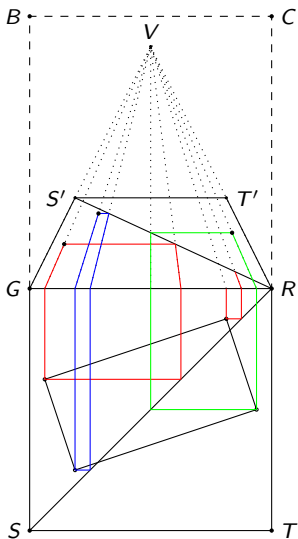
Drawing a box in perspective



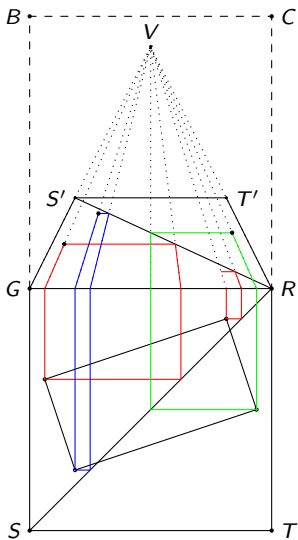
Drawing a box in perspective



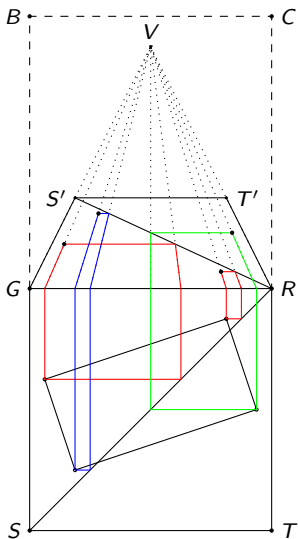
Drawing a box in perspective



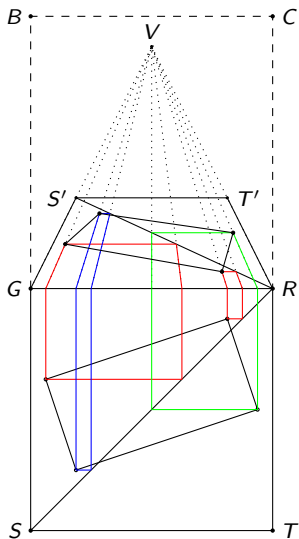
Drawing a box in perspective



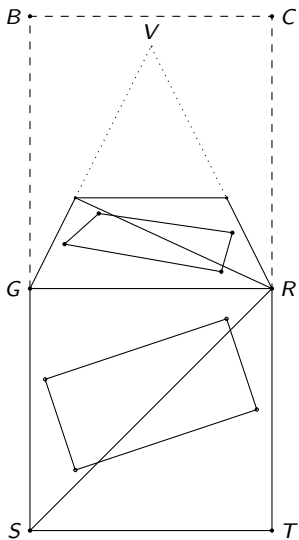
Drawing a box in perspective



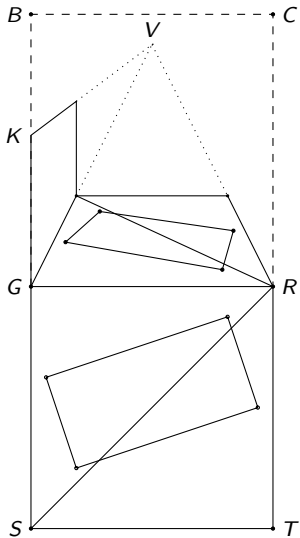
Drawing a box in perspective



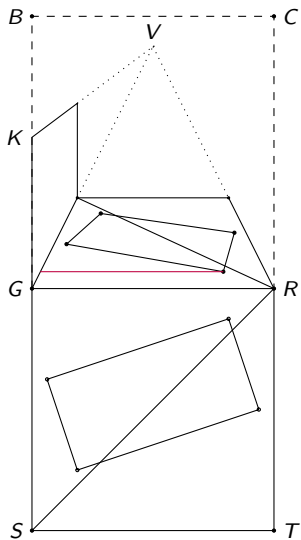
Drawing a box in perspective



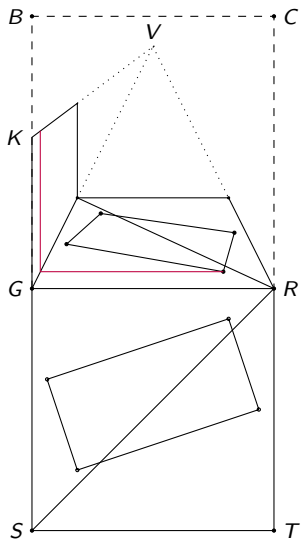
Drawing a box in perspective



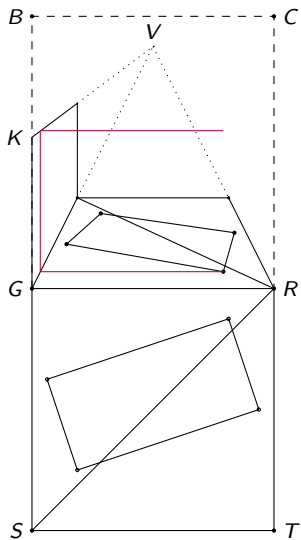
Drawing a box in perspective



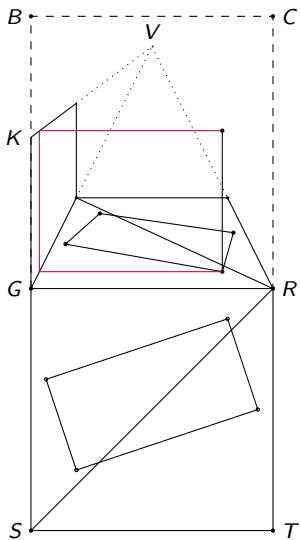
Drawing a box in perspective



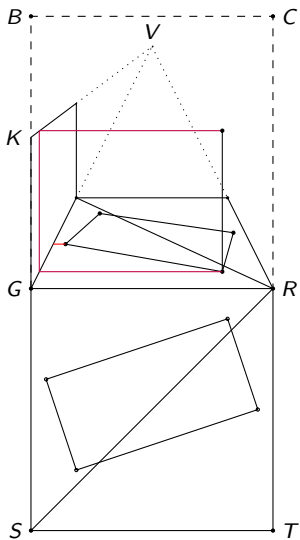
Drawing a box in perspective



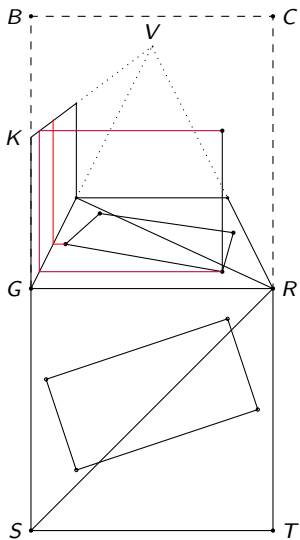
Drawing a box in perspective



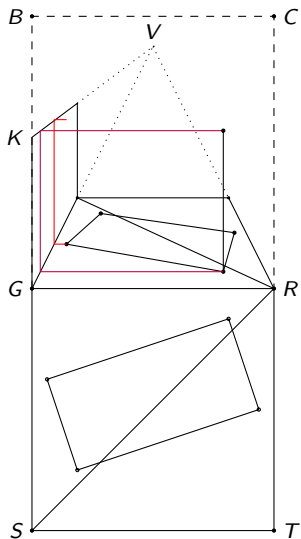
Drawing a box in perspective



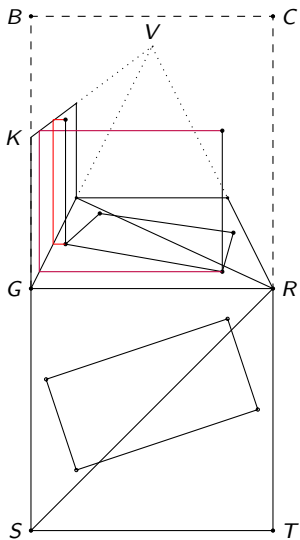
Drawing a box in perspective



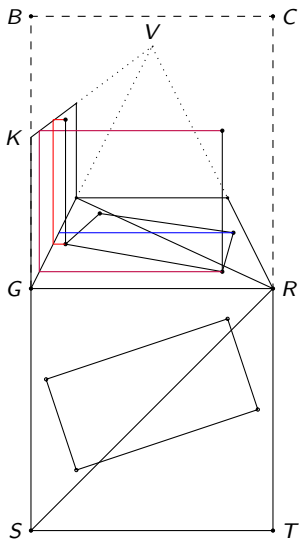
Drawing a box in perspective



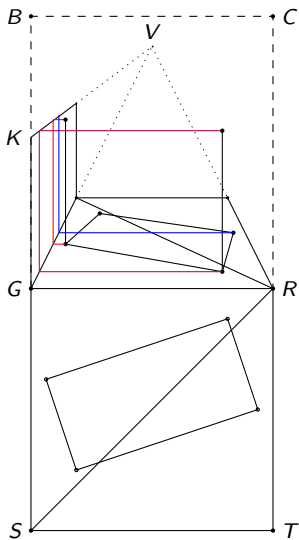
Drawing a box in perspective



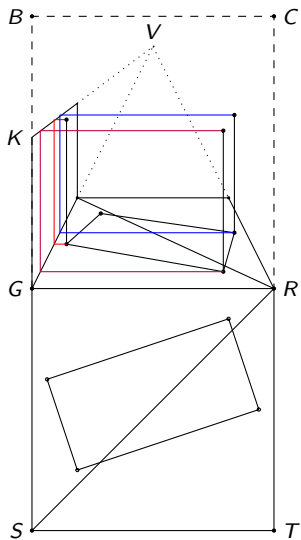
Drawing a box in perspective



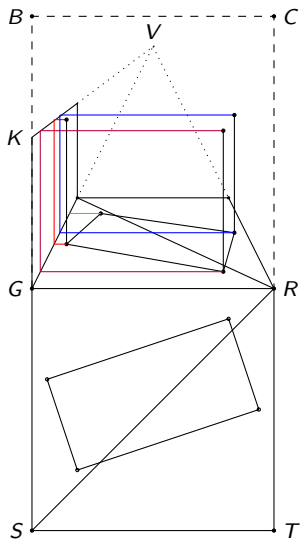
Drawing a box in perspective



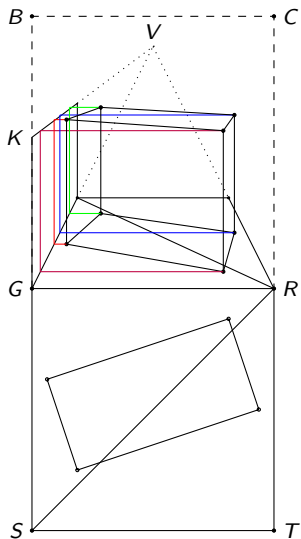
Drawing a box in perspective



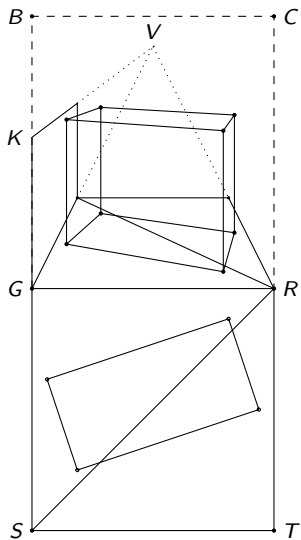
Drawing a box in perspective



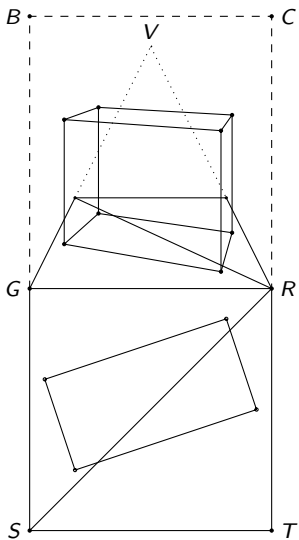
Drawing a box in perspective



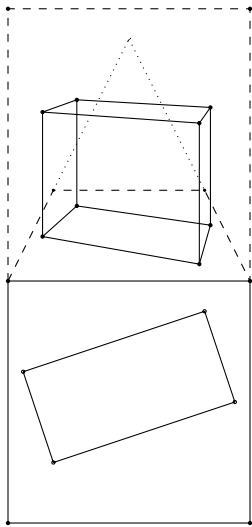
Drawing a box in perspective



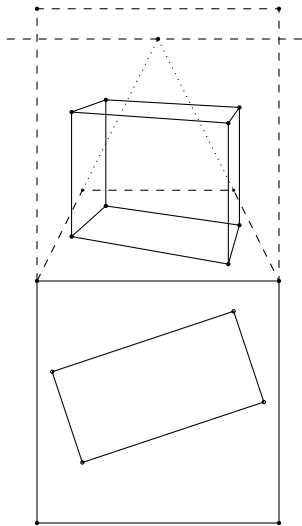
Drawing a box in perspective



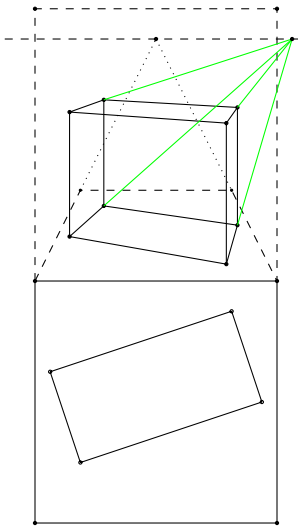
Drawing a box in perspective



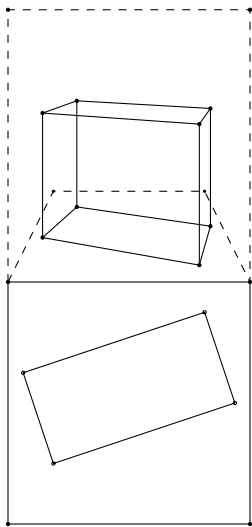
Drawing a box in perspective



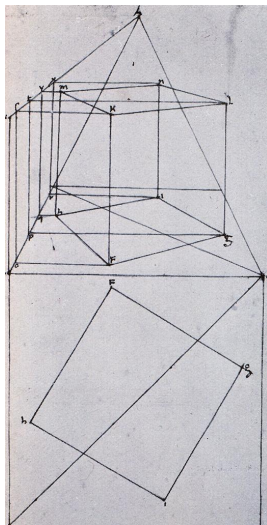
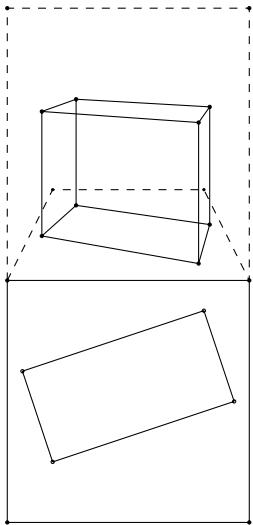
Drawing a box in perspective



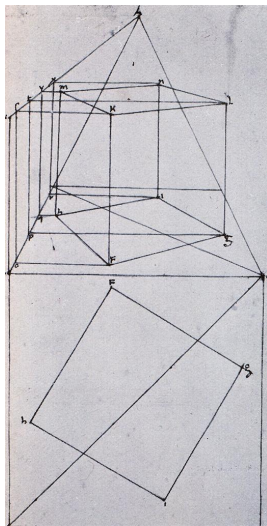
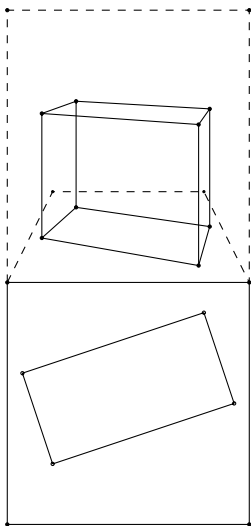
Drawing a box in perspective



Drawing a box in perspective



Drawing a box in perspective



Richard Hammack:

www.people.vcu.edu/~rhammack/Math121/