

Sundials 3

Laurence D. Finston

Last updated: October 11, 2007

This document is part of GNU 3DLDF, a package for three-dimensional drawing.

Copyright (C) 2007, 2008, 2009, 2010, 2011 The Free Software Foundation

GNU 3DLDF is free software; you can redistribute it and/or modify it under the terms of the GNU General Public License as published by the Free Software Foundation; either version 3 of the License, or (at your option) any later version.

GNU 3DLDF is distributed in the hope that it will be useful, but WITHOUT ANY WARRANTY; without even the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the GNU General Public License for more details.

You should have received a copy of the GNU General Public License along with GNU 3DLDF; if not, write to the Free Software Foundation, Inc., 51 Franklin St, Fifth Floor, Boston, MA 02110-1301 USA

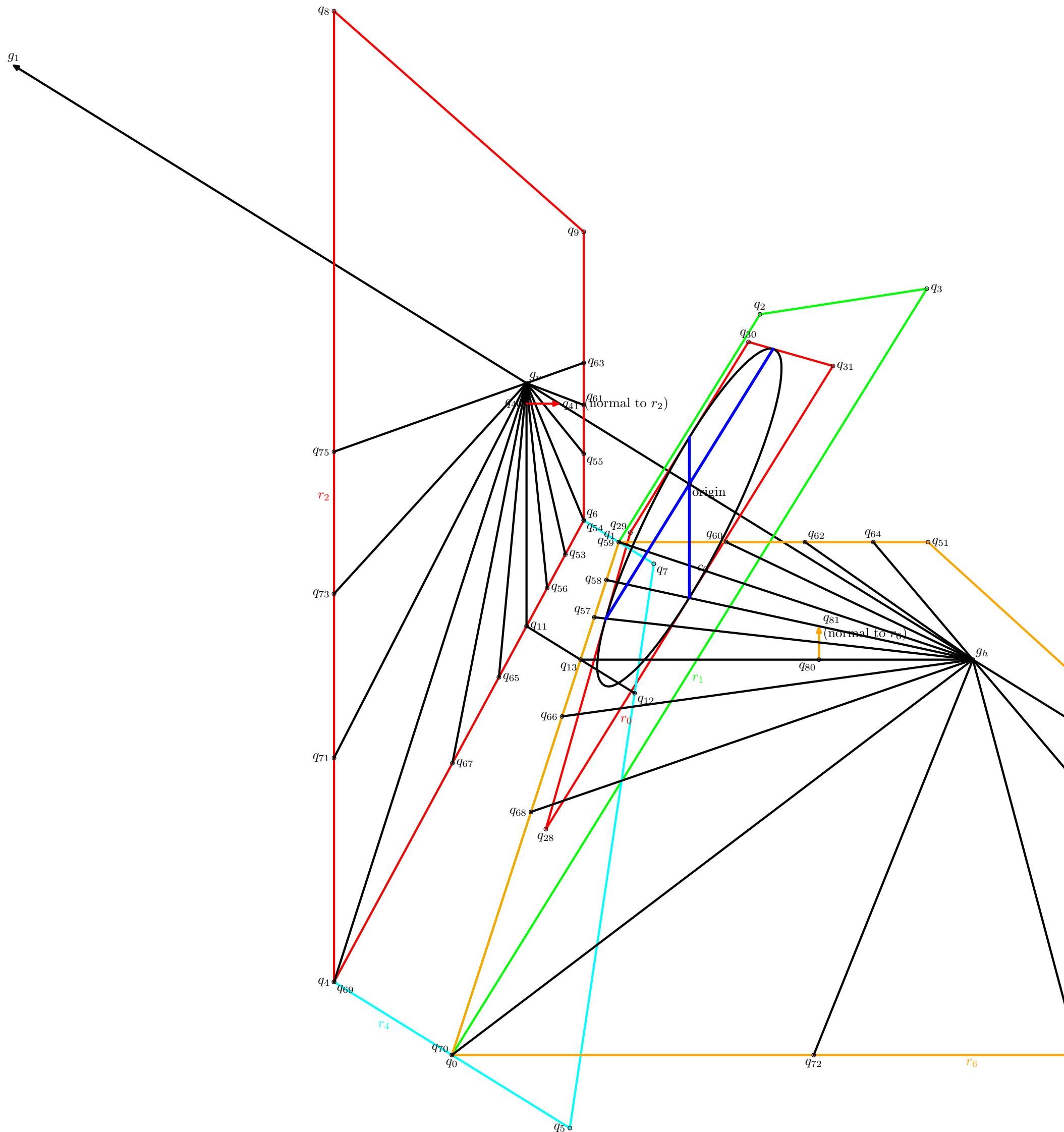
See the GNU Free Documentation License for the copying conditions that apply to this document.

You should have received a copy of the GNU Free Documentation License along with GNU 3DLDF; if not, write to the Free Software Foundation, Inc., 51 Franklin St, Fifth Floor, Boston, MA 02110-1301 USA

Contents

Perspective Projections	
Jerusalem, Israel 31° 47' N, 35° 13' E	1
Athens, Greece 37° 58' N 23° 43' E	2
Chicago, Illinois, USA 41° 52' 55" N 87° 37' 40" W	3
London, UK 51° 30' 28" N 0° 7' 41" W	4
Göttingen, Germany 51° 32' N 9° 56' E	5
St. Petersburg, Russia 59° 56' N, 30° 20' E	6
Jerusalem, Israel 31° 47' N, 35° 13' E	
Perspective projection	7
Vertical Dial, Facing Due South	8
Horizontal Dial	9
Athens, Greece 37° 58' N 23° 43' E	
Perspective projection	10
Vertical Dial, Facing Due South	11
Horizontal Dial	12
Chicago, Illinois, USA 41° 52' 55" N 87° 37' 40" W	
Perspective projection	13
Vertical Dial, Facing Due South	14
Horizontal Dial	15
London, UK 51° 30' 28" N 0° 7' 41" W	
Perspective projection	16
Vertical Dial, Facing Due South	17
Horizontal Dial	18
Göttingen, Germany 51° 32' N 9° 56' E	
Perspective projection	19
Vertical Dial, Facing Due South	20
Horizontal Dial	21
St. Petersburg, Russia 59° 56' N, 30° 20' E	
Perspective projection	22
Vertical Dial, Facing Due South	19
Horizontal Dial	24

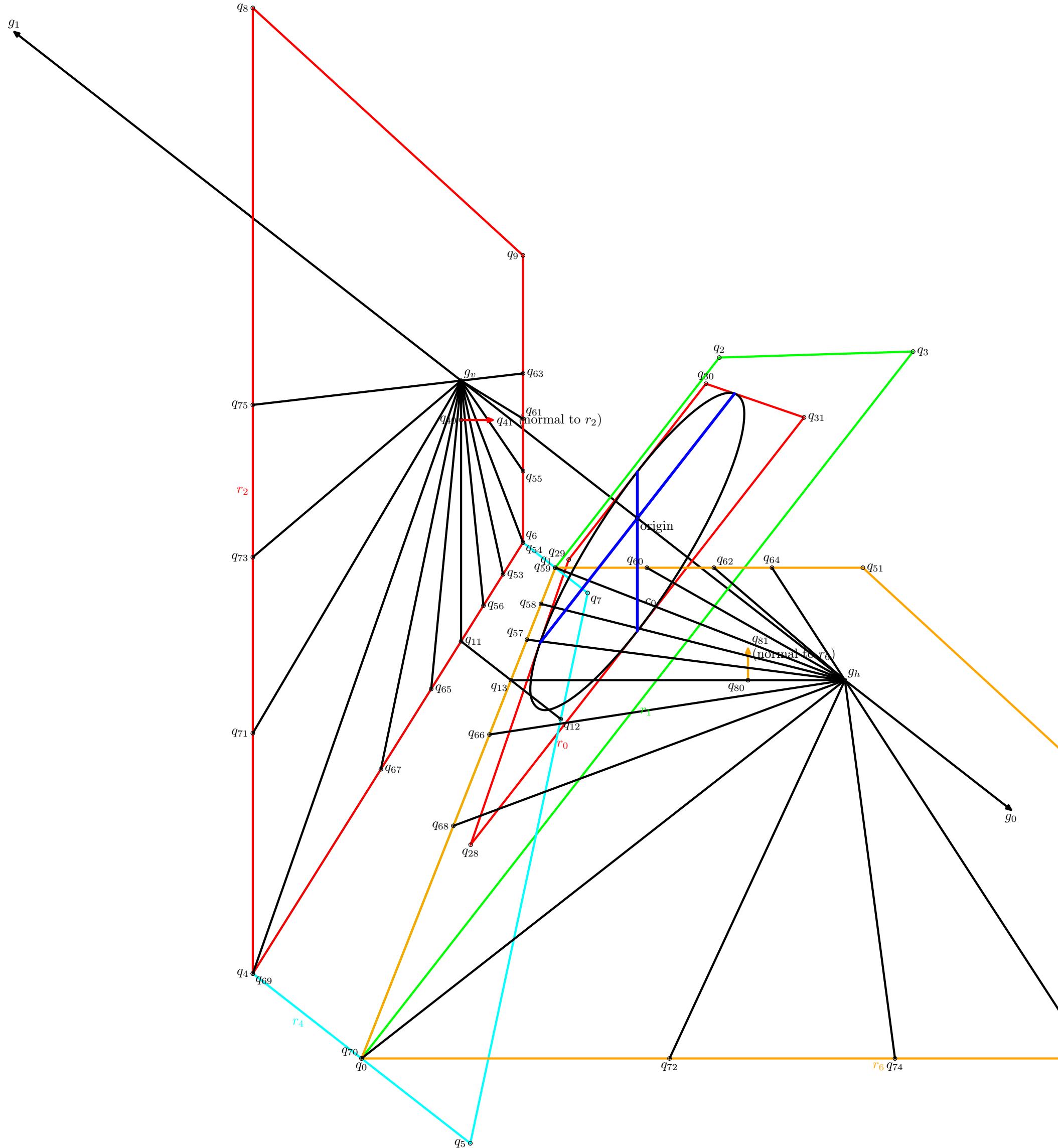
Jerusalem, Israel $31^{\circ} 47' \text{ N}$, $35^{\circ} 13' \text{ E}$



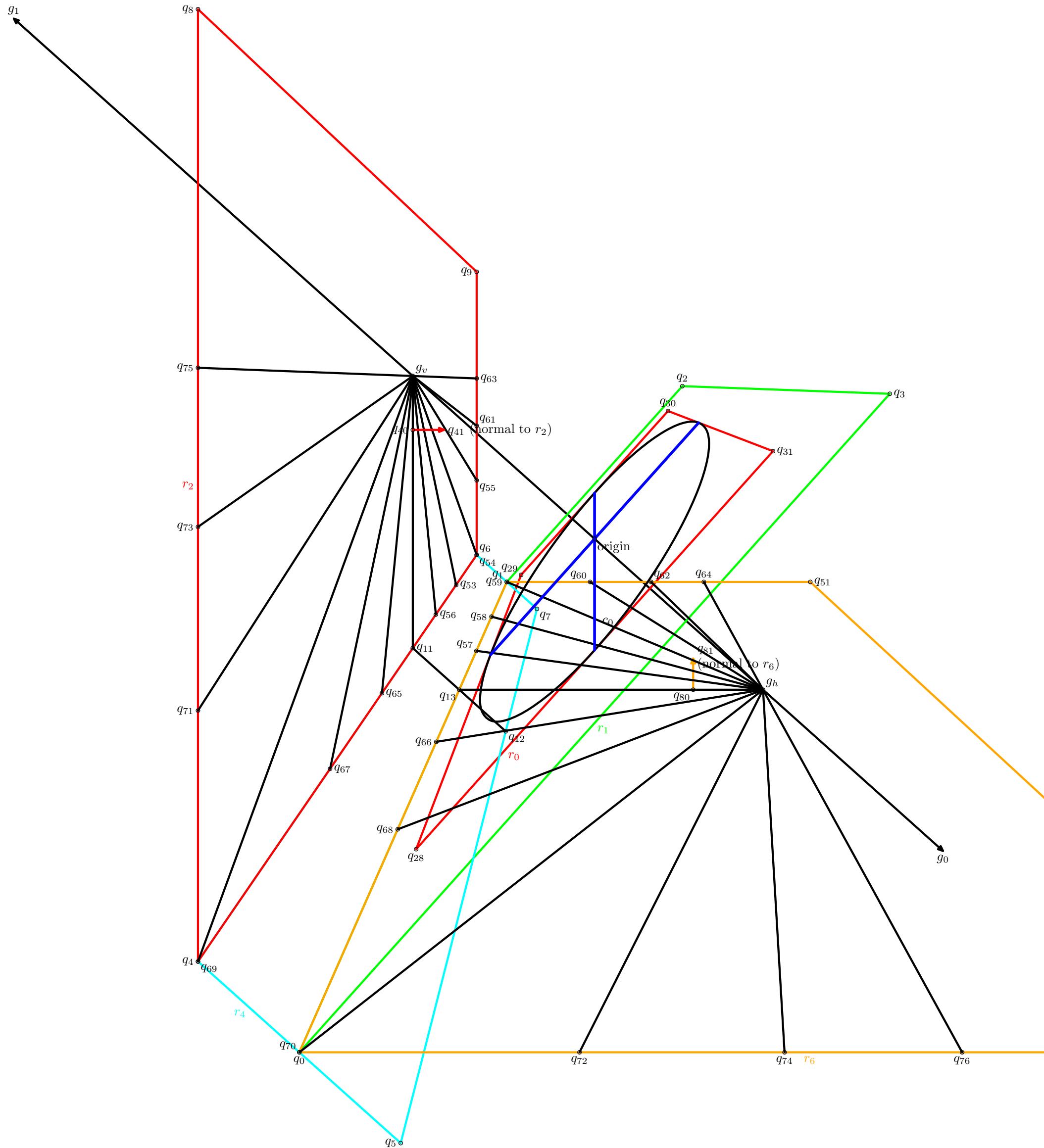
Perspective projection

Perspective projection
Jerusalem, Israel $31^{\circ} 47' \text{ N}$, $35^{\circ} 13' \text{ E}$

Focus: position = $(0, 5, -12)$, direction = $(0, 5, 10)$, distance = 10
(dimensions in centimeters)

Athens, Greece $37^{\circ} 58' \text{ N}$ $23^{\circ} 43' \text{ E}$ **Perspective projection**Latitude $41^{\circ} 54' \text{ N}$ (Athens, Greece)Focus: position = $(0, 5, -12)$, direction = $(0, 5, 10)$, distance = 10
(dimensions in centimeters)

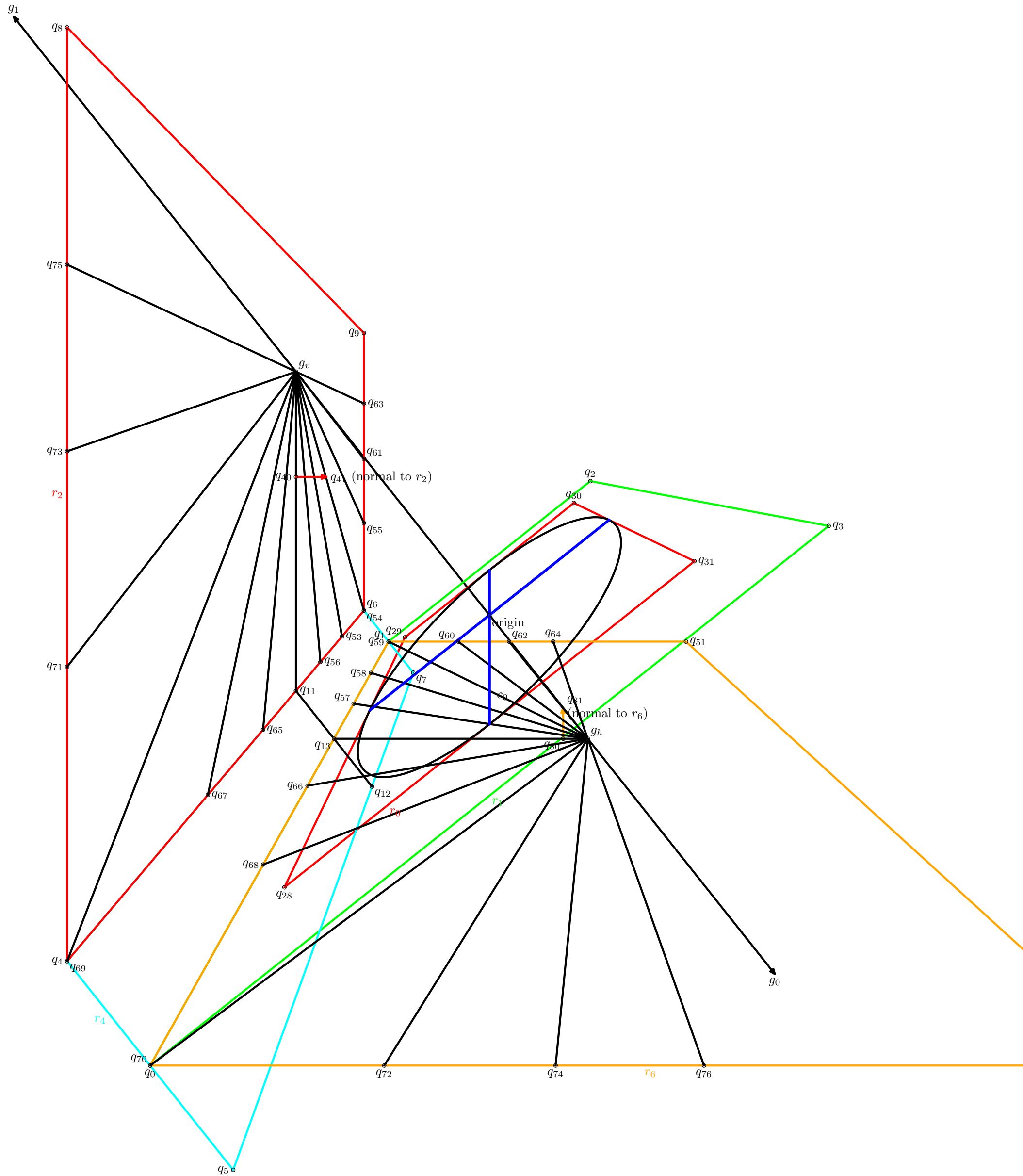
Chicago, Illinois, USA $41^{\circ} 52' 55''$ N $87^{\circ} 37' 40''$ W



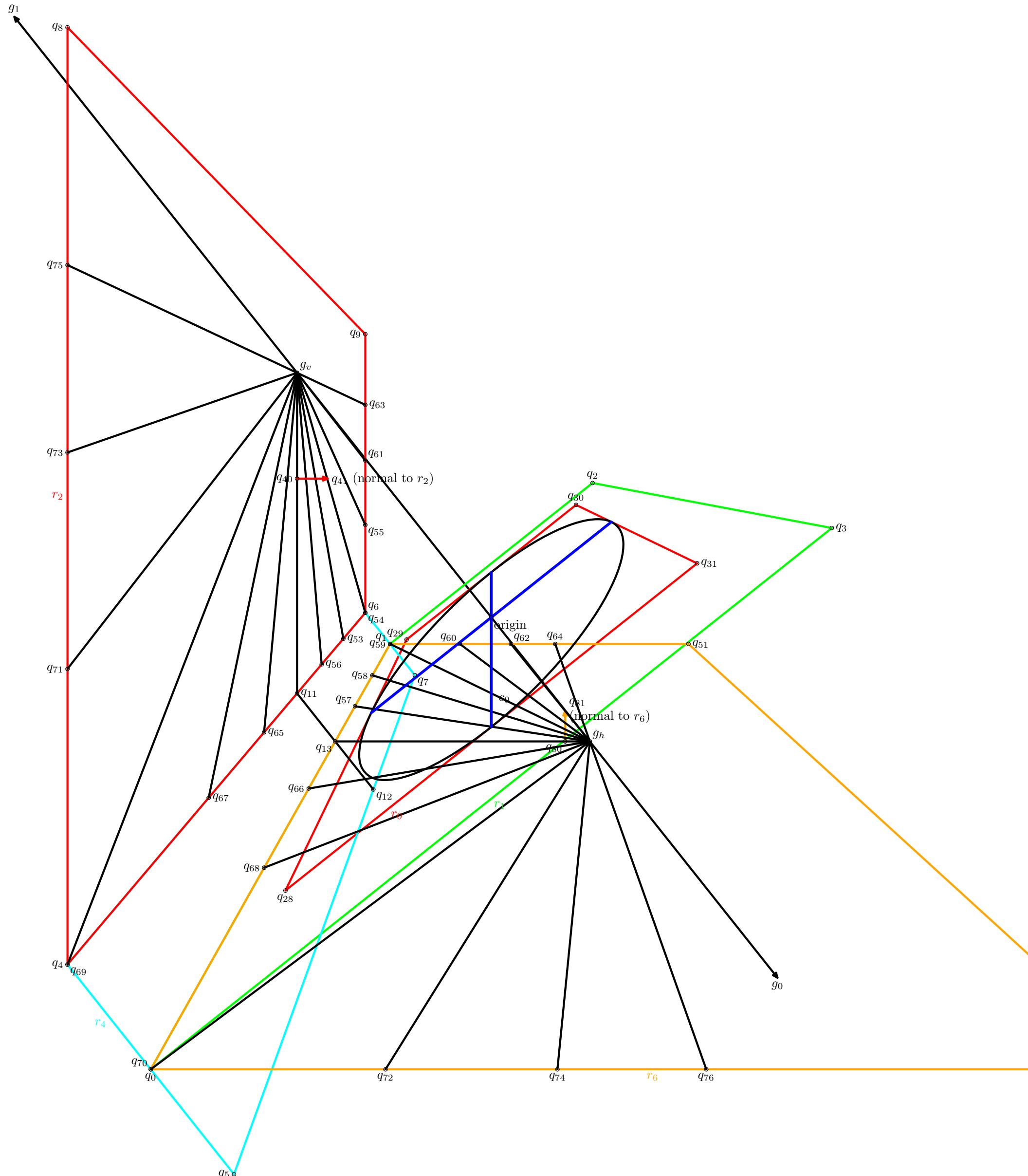
Perspective projection

Perspective projection
Chicago, Illinois, USA $41^{\circ} 52' 55''$ N $87^{\circ} 37' 40''$ W

Focus: position = $(0, 5, -12)$, direction = $(0, 5, 10)$, distance = 10
(dimensions in centimeters)

London, UK $51^{\circ} 30' 28''$ N, $0^{\circ} 7' 41''$ W**Perspective projection**Latitude $51^{\circ} 30' 28''$ N (London, UK)Focus: position = $(0, 5, -12)$, direction = $(0, 5, 10)$, distance = 10
(dimensions in centimeters)

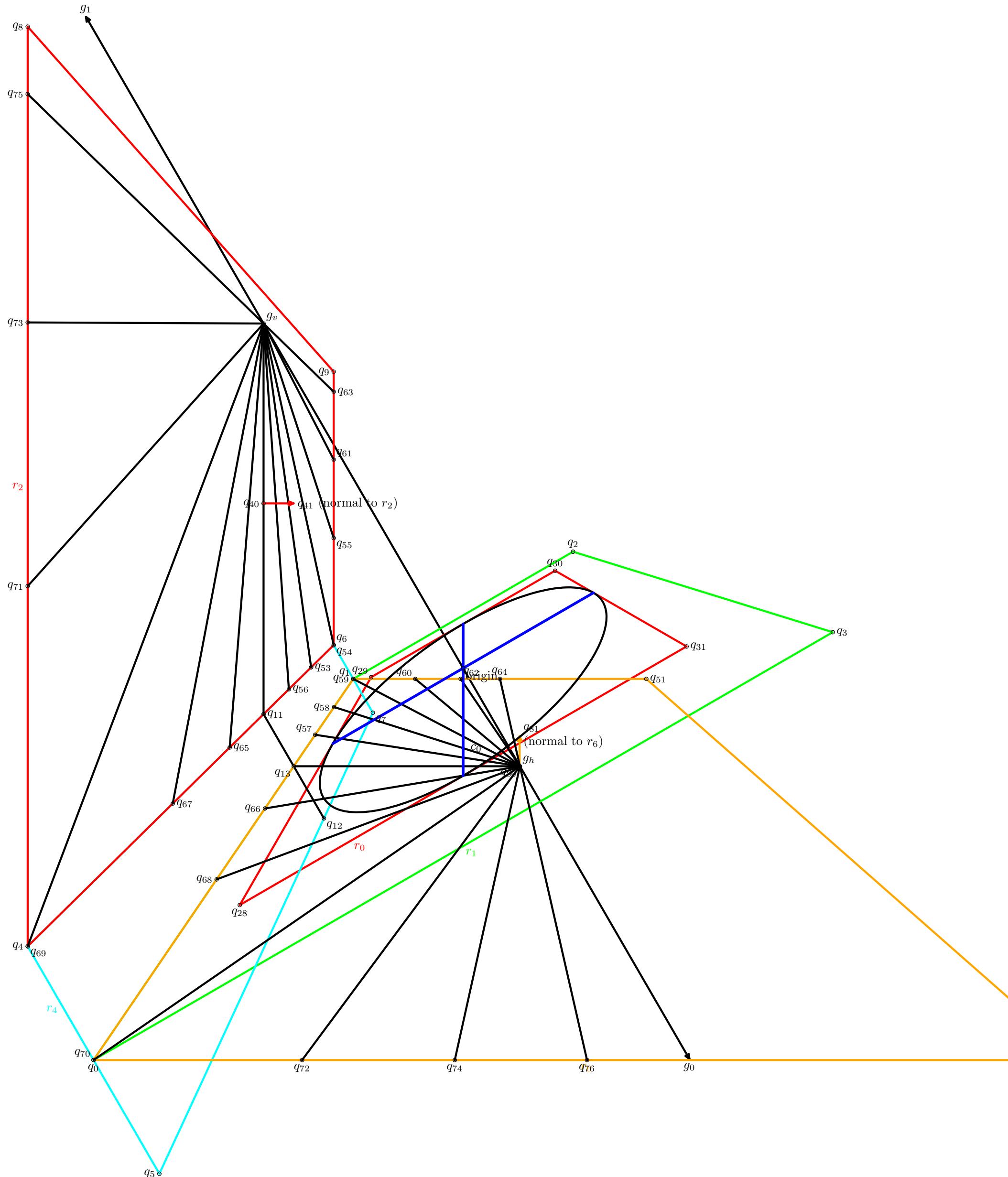
Göttingen, Germany 51° 32' N, 9° 56' E

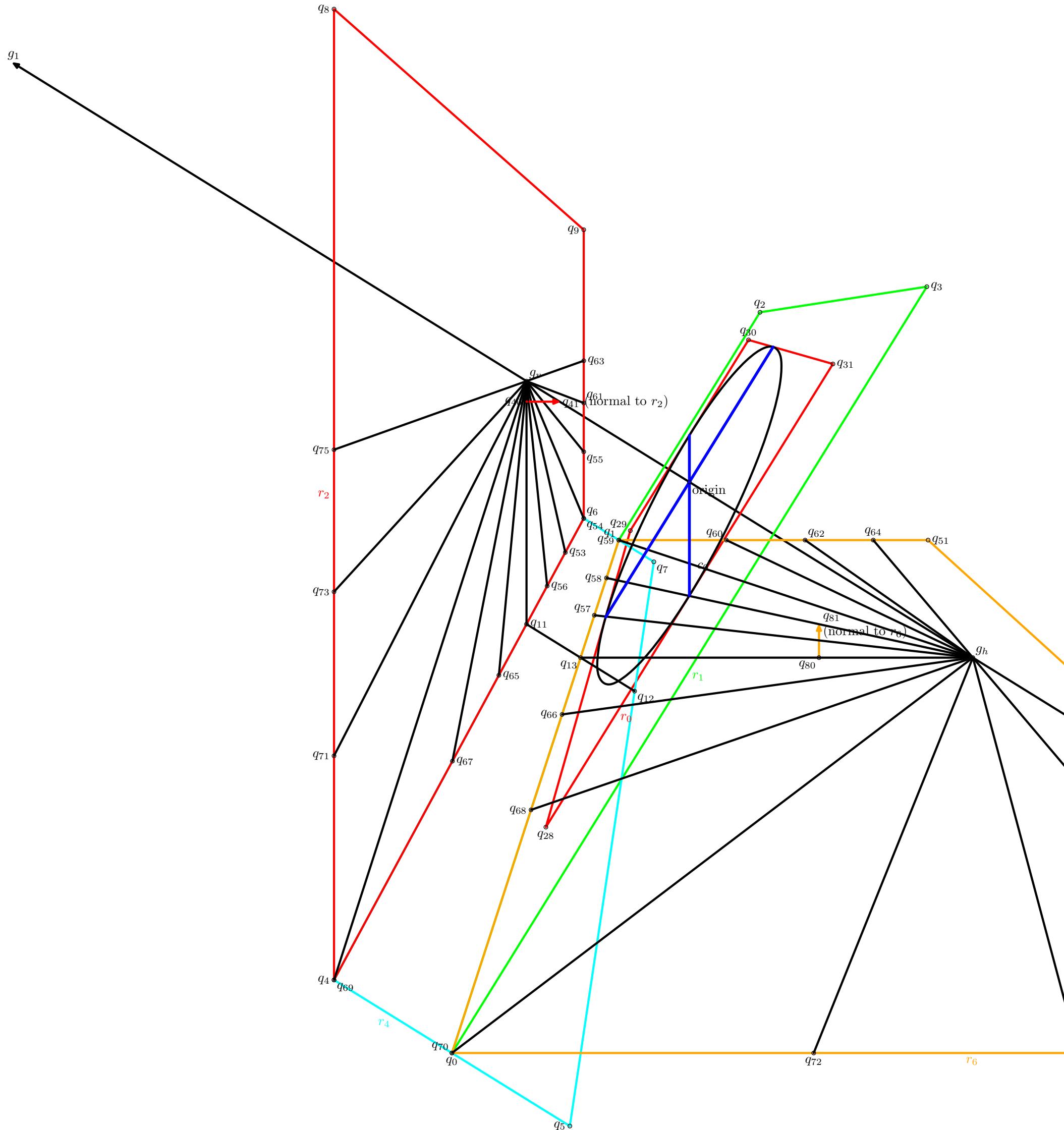


Perspective projection

Perspective projection

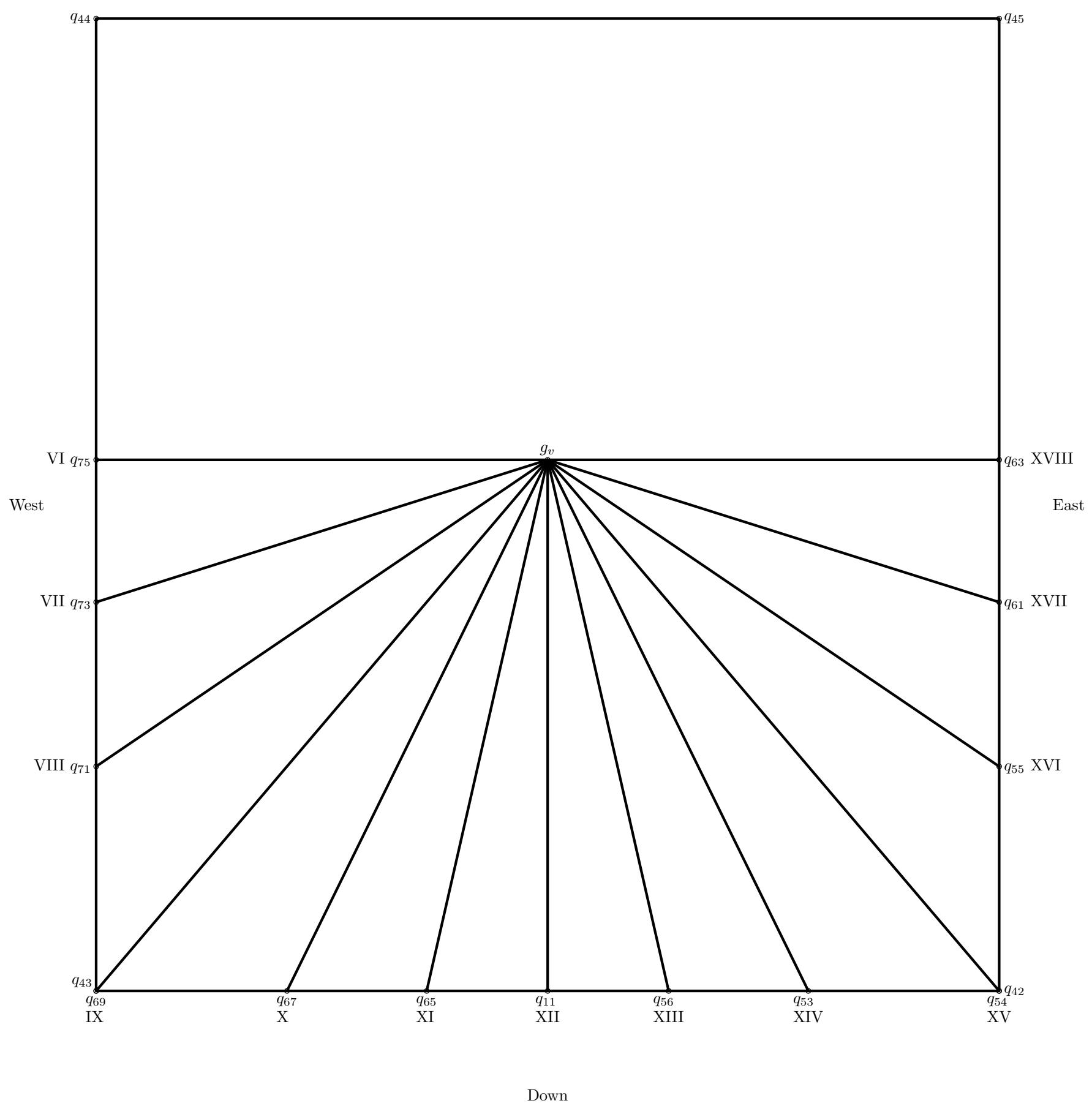
Latitude 51° 32' N (Göttingen, Germany)
Focus: position = (0, 5, -12), direction = (0, 5, 10), distance = 10
(dimensions in centimeters)

St. Petersburg, Russia $59^{\circ} 56' \text{ N}$, $30^{\circ} 20' \text{ E}$ **Perspective projection**Latitude $51^{\circ} 32' \text{ N}$ (Göttingen, Germany)Focus: position = $(0, 5, -12)$, direction = $(0, 5, 10)$, distance = 10
(dimensions in centimeters)

Jerusalem, Israel $31^\circ 47' \text{ N}$, $35^\circ 13' \text{ E}$ **Perspective projection**Jerusalem, Israel $31^\circ 47' \text{ N}$, $35^\circ 13' \text{ E}$ Focus: position = $(0, 5, -12)$, direction = $(0, 5, 10)$, distance = 10
(dimensions in centimeters)

Jerusalem, Israel $31^\circ 47' \text{ N}$, $35^\circ 13' \text{ E}$

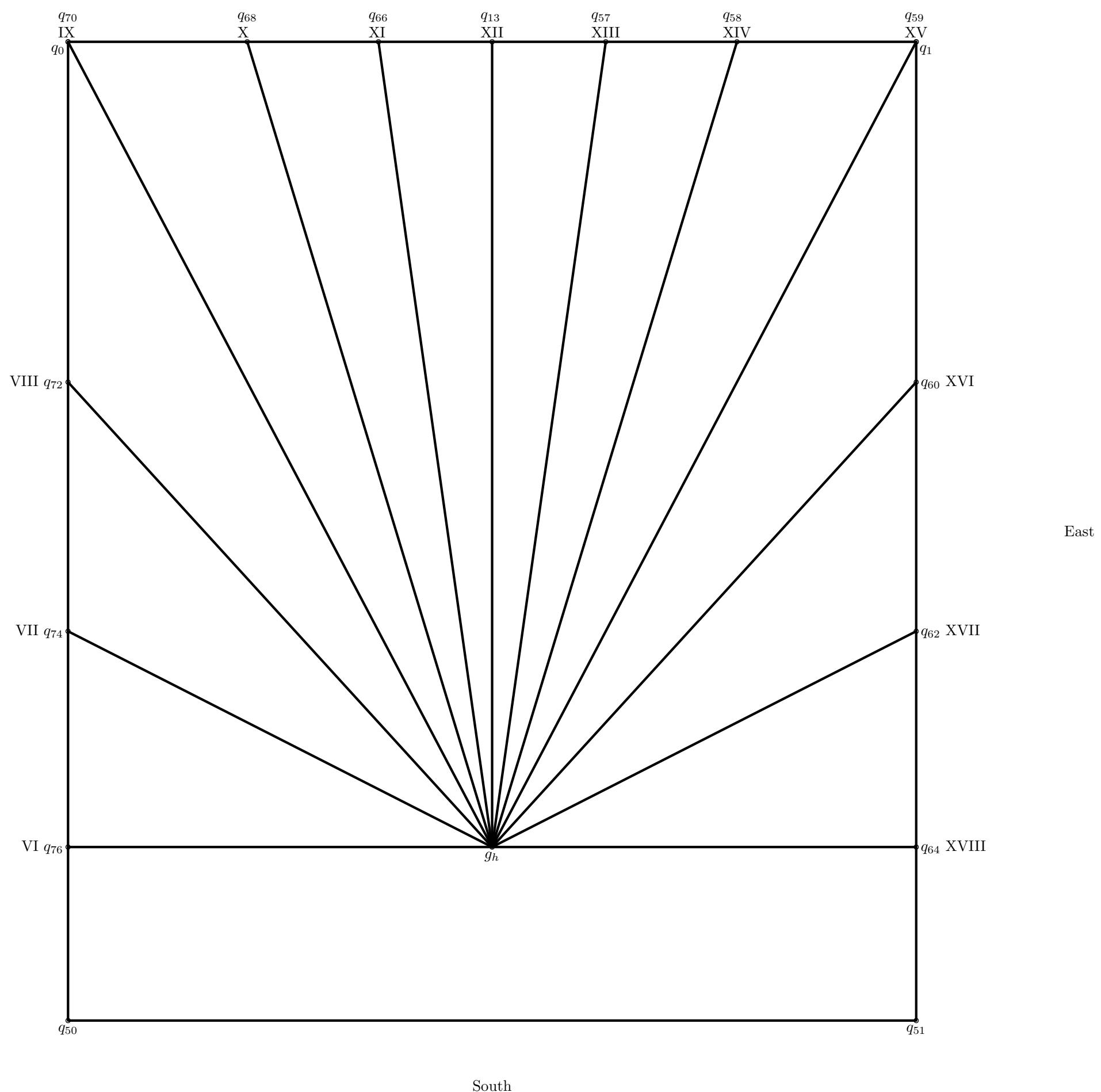
Up



Parallel projection onto the vertical plane (plane of r_1)
 Vertical dial facing due south
 Jerusalem, Israel $31^\circ 47' \text{ N}$, $35^\circ 13' \text{ E}$

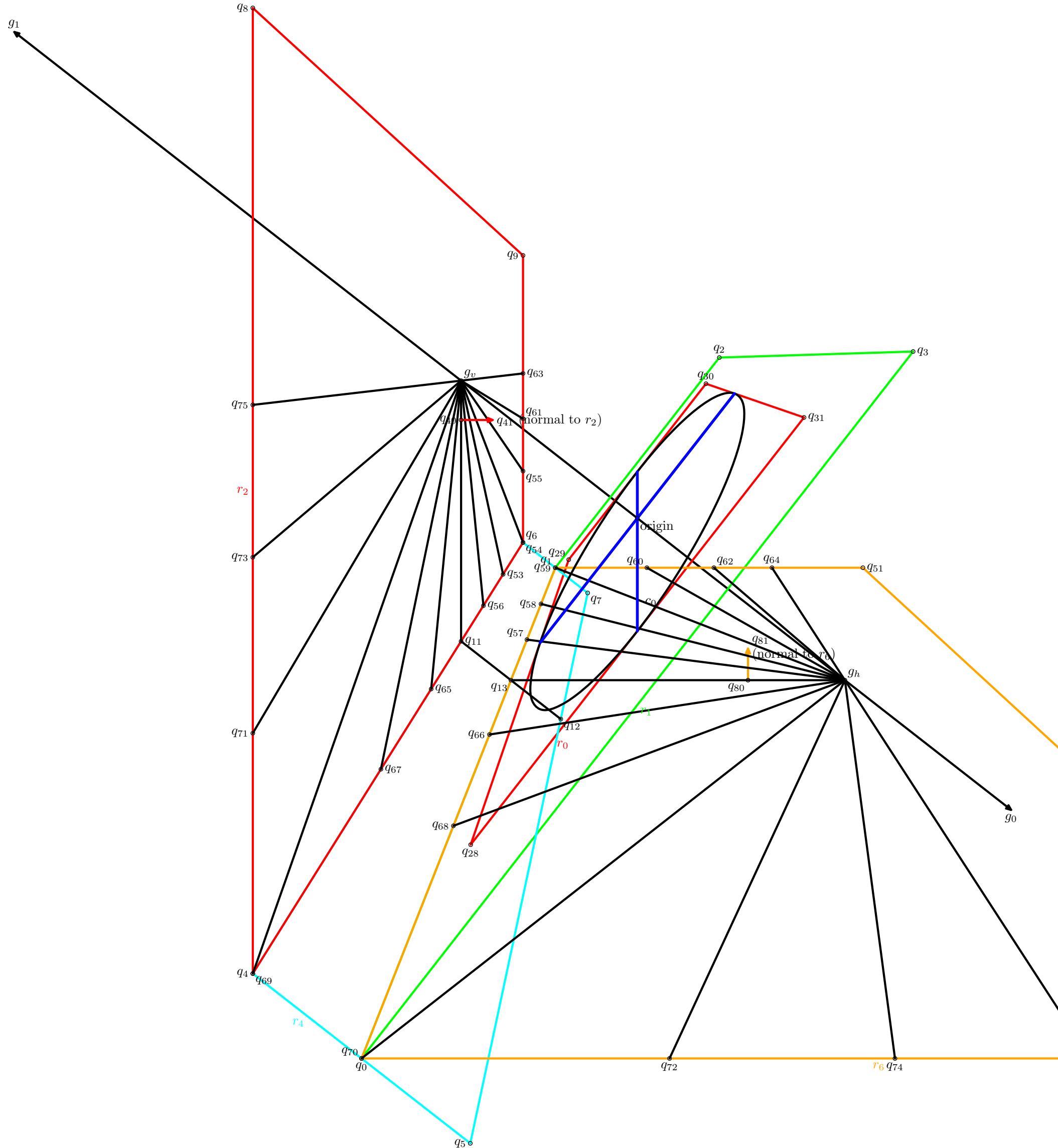
Jerusalem, Israel $31^{\circ} 47' \text{ N}$, $35^{\circ} 13' \text{ E}$

North



Parallel projection onto the horizontal plane (plane of r_6)
Horizontal dial
Jerusalem, Israel $31^{\circ} 47' \text{ N}$, $35^{\circ} 13' \text{ E}$

Athens, Greece $37^{\circ} 58' \text{ N}$ $23^{\circ} 43' \text{ E}$



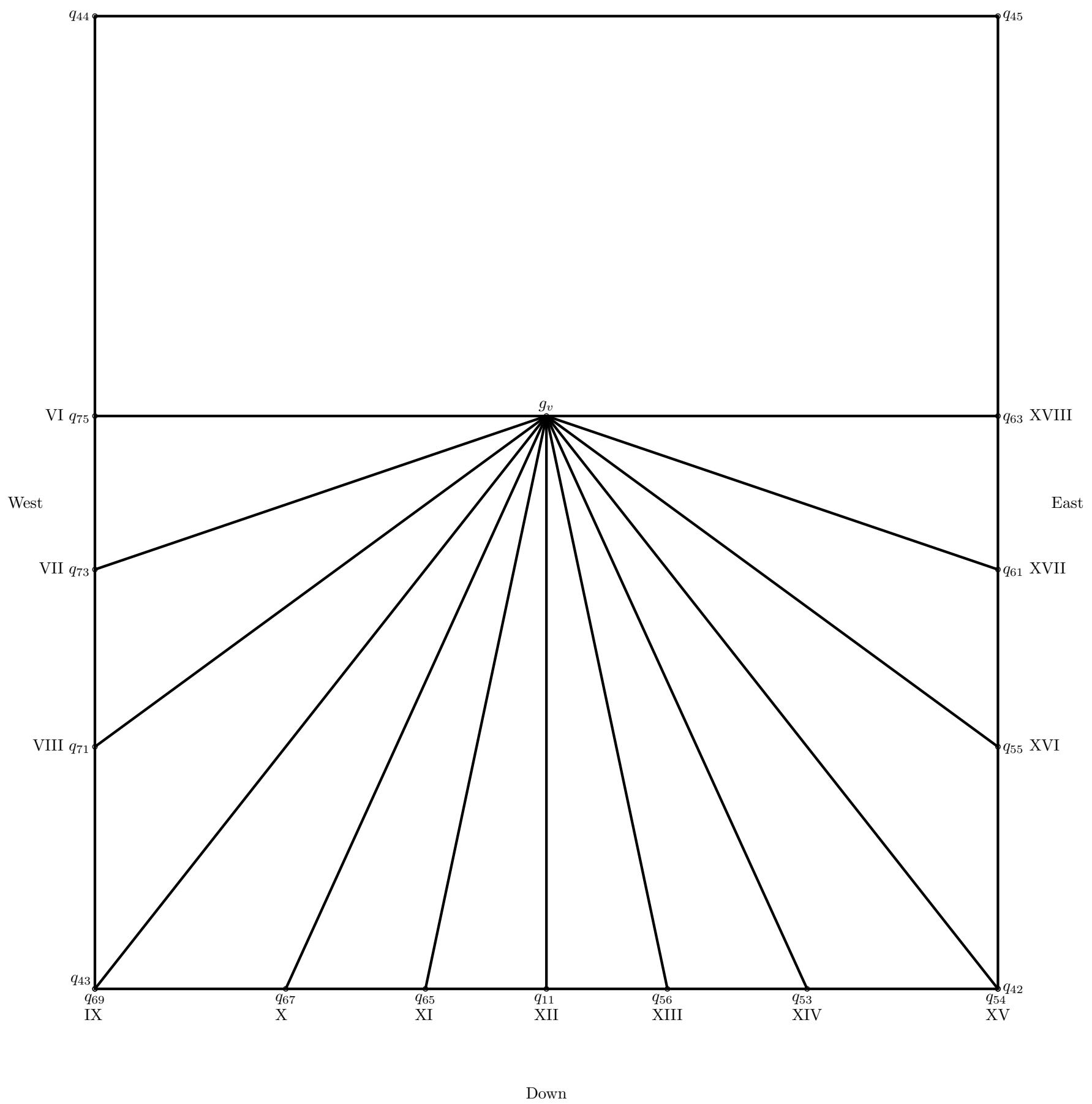
Perspective projection

Perspective projection
Latitude 41° 54' N (Athens, Greece)

Focus: position = $(0, 5, -12)$, direction = $(0, 5, 10)$, distance = 10
(dimensions in centimeters)

Athens, Greece $37^\circ 58' N$ $23^\circ 43' E$

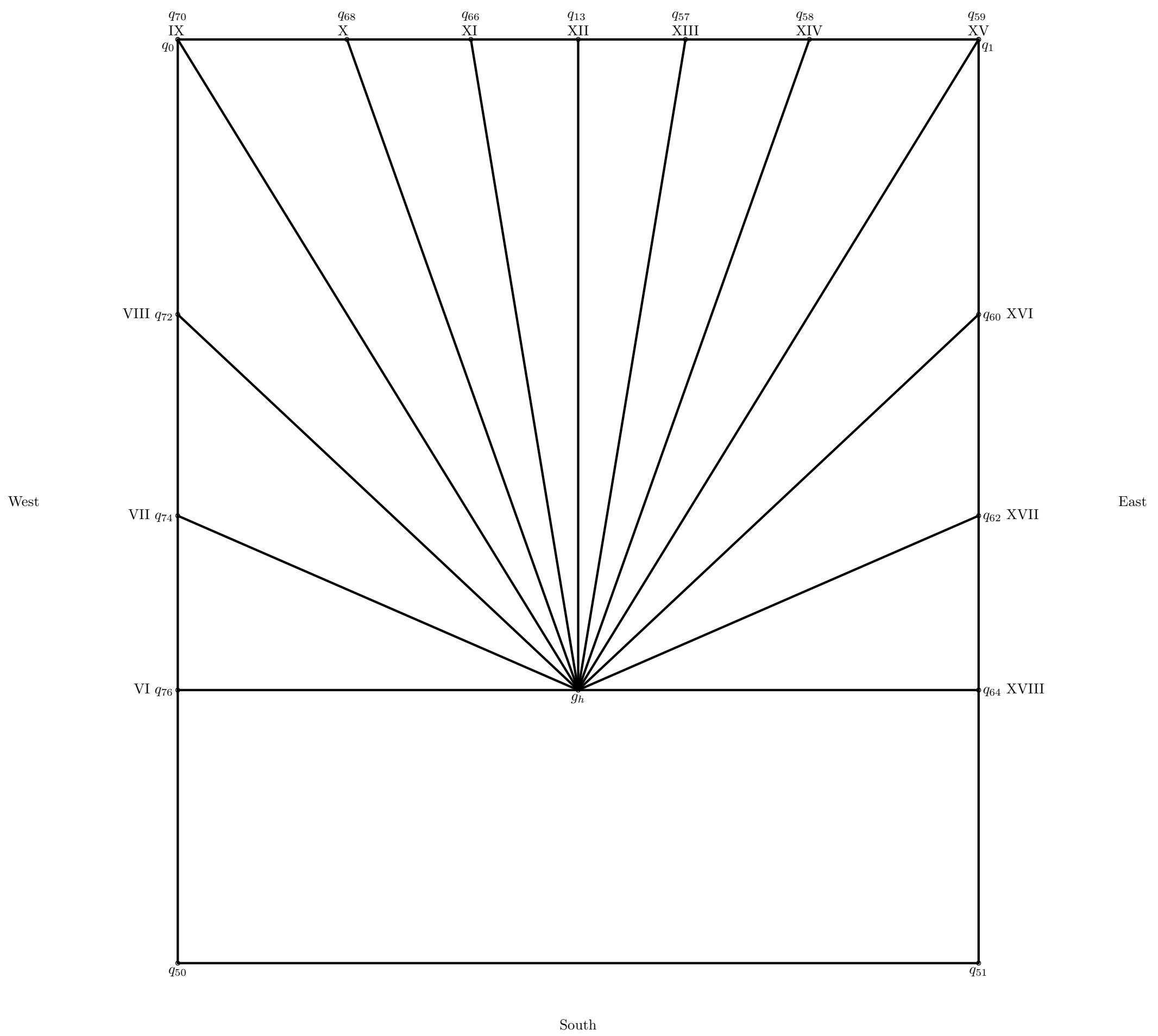
Up



Parallel projection onto the vertical plane (plane of r_1)
 Vertical dial facing due south
 Latitude $41^\circ 54' N$ (Athens, Greece)

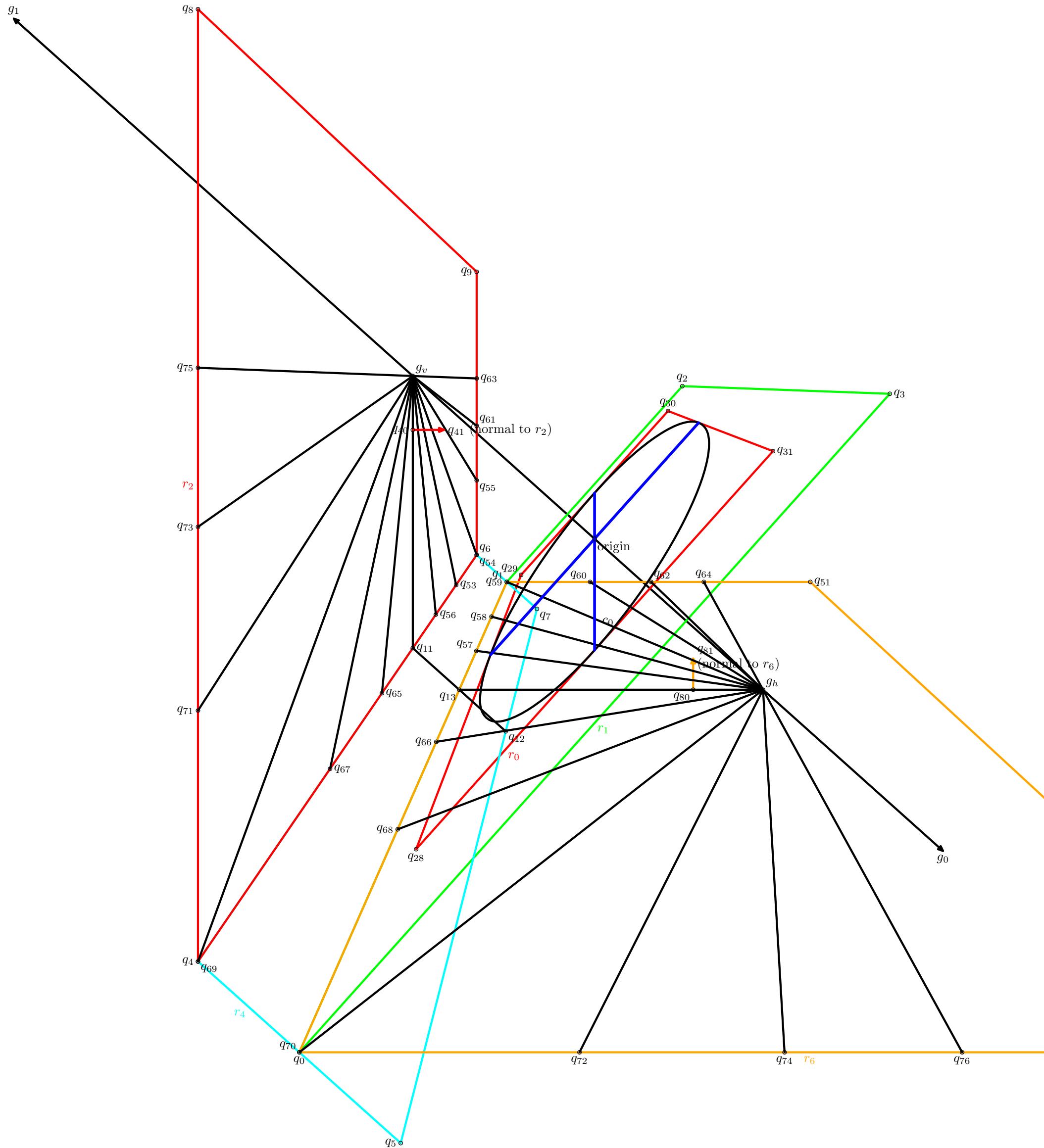
Athens, Greece $37^{\circ} 58' N$ $23^{\circ} 43' E$

North



Parallel projection onto the horizontal plane (plane of r_6)
 Horizontal dial
 Latitude $41^{\circ} 54' N$ (Athens, Greece)

Chicago, Illinois, USA $41^{\circ} 52' 55''$ N $87^{\circ} 37' 40''$ W



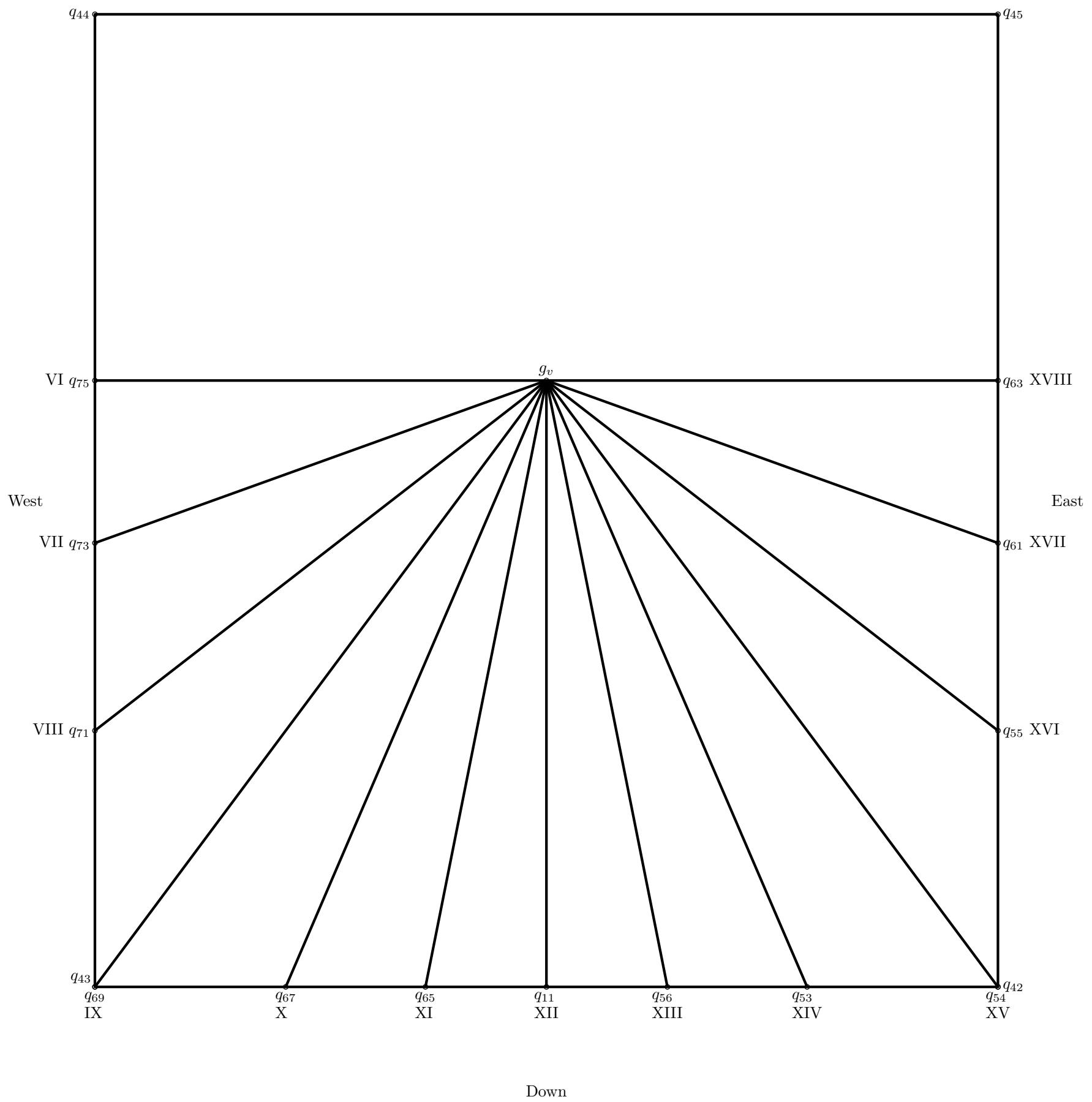
Perspective projection

Perspective projection
Chicago, Illinois, USA $41^{\circ} 52' 55''$ N $87^{\circ} 37' 40''$ W

Focus: position = $(0, 5, -12)$, direction = $(0, 5, 10)$, distance = 10
(dimensions in centimeters)

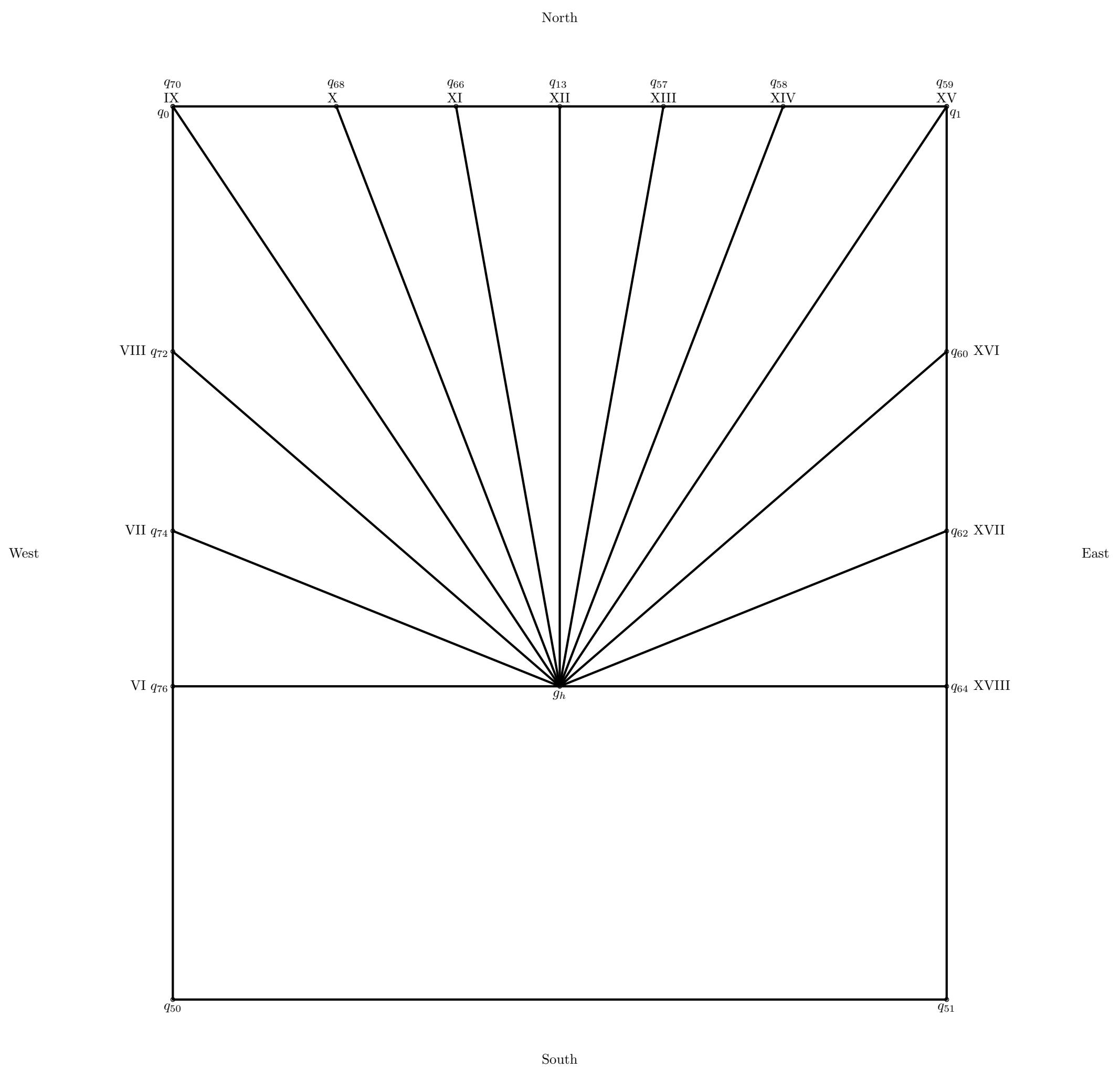
Chicago, Illinois, USA $41^{\circ} 52' 55''$ N $87^{\circ} 37' 40''$ W

Up



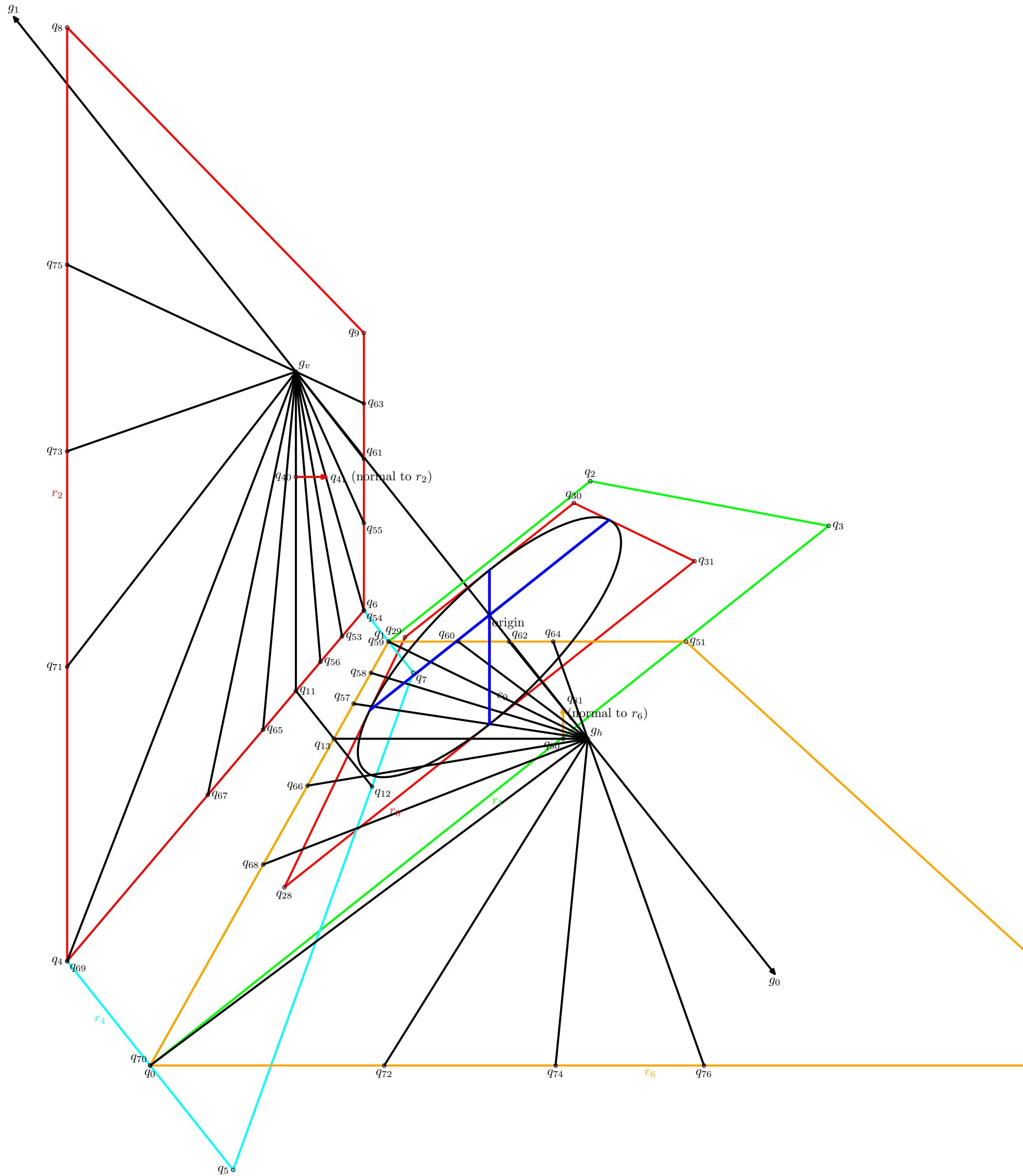
Parallel projection onto the vertical plane (plane of r_1)
Vertical dial facing due south
Chicago, Illinois, USA $41^{\circ} 52' 55''$ N $87^{\circ} 37' 40''$ W

Chicago, Illinois, USA $41^{\circ} 52' 55''$ N $87^{\circ} 37' 40''$ W



Parallel projection onto the horizontal plane (plane of r_6)
Horizontal dial
Chicago, Illinois, USA $41^{\circ} 52' 55''$ N $87^{\circ} 37' 40''$ W

London, UK $51^{\circ} 30' 28''$ N, $0^{\circ} 7' 41''$ W



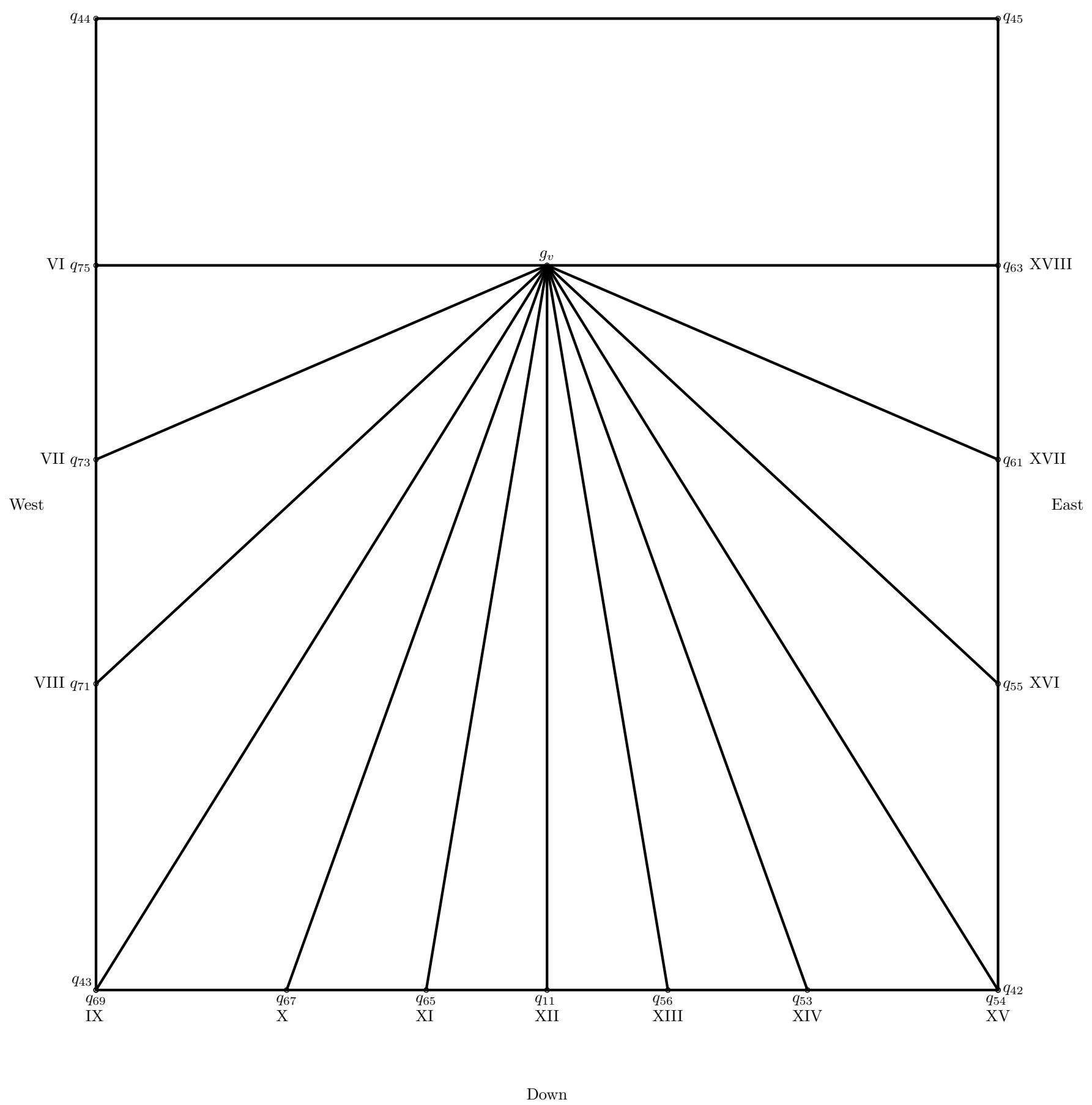
Perspective projection

Latitude 51° 30' 28" N (London, UK)

Focus: position = (0, 5, -12), direction = (0, 5, 10), distance = 10
(dimensions in centimeters)

London, UK $51^\circ 30' 28''$ N, $0^\circ 7' 41''$ W

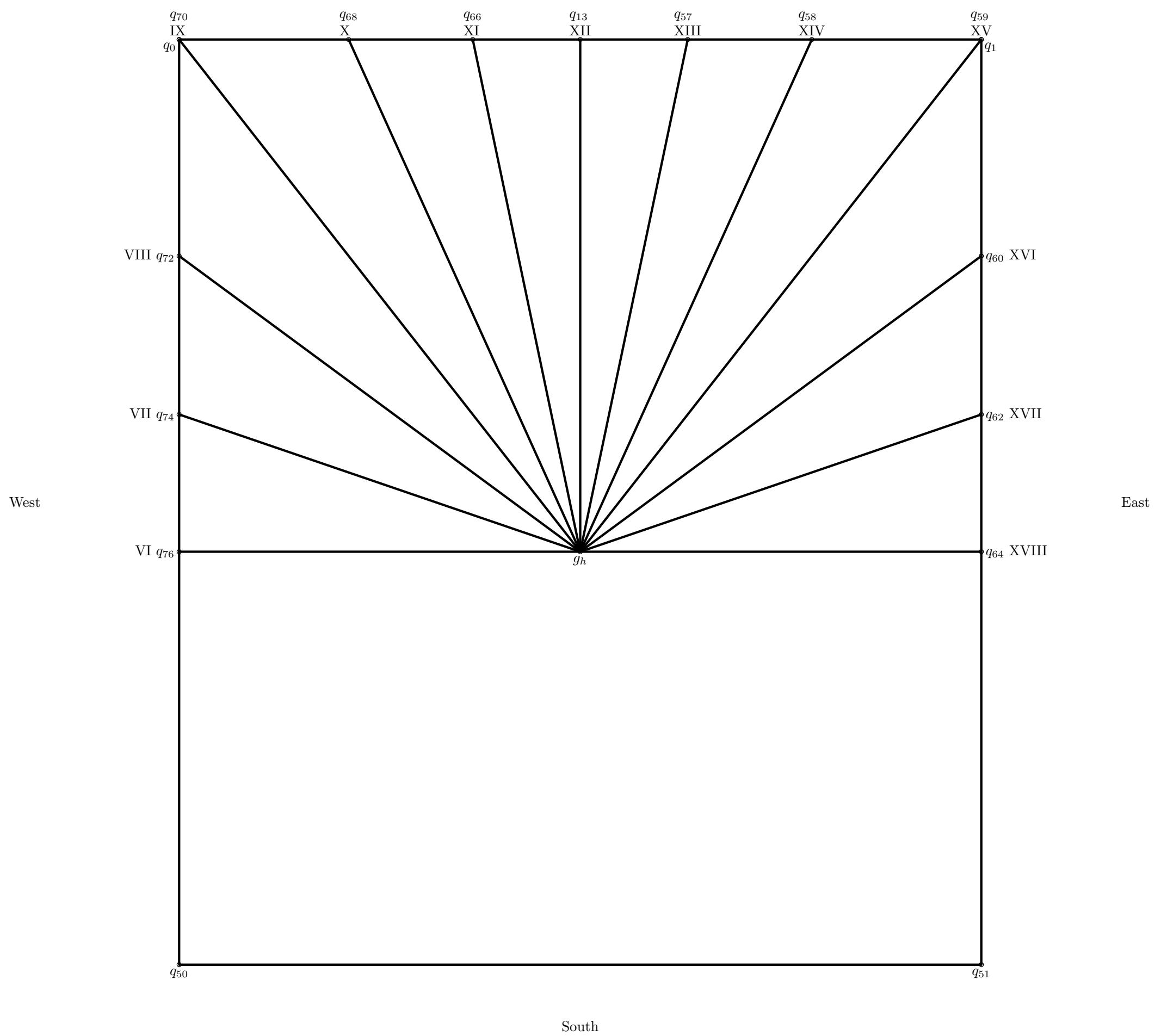
Up



Parallel projection onto the vertical plane (plane of r_1)
Vertical dial facing due south
Latitude $51^\circ 30' 28''$ N (London, UK)

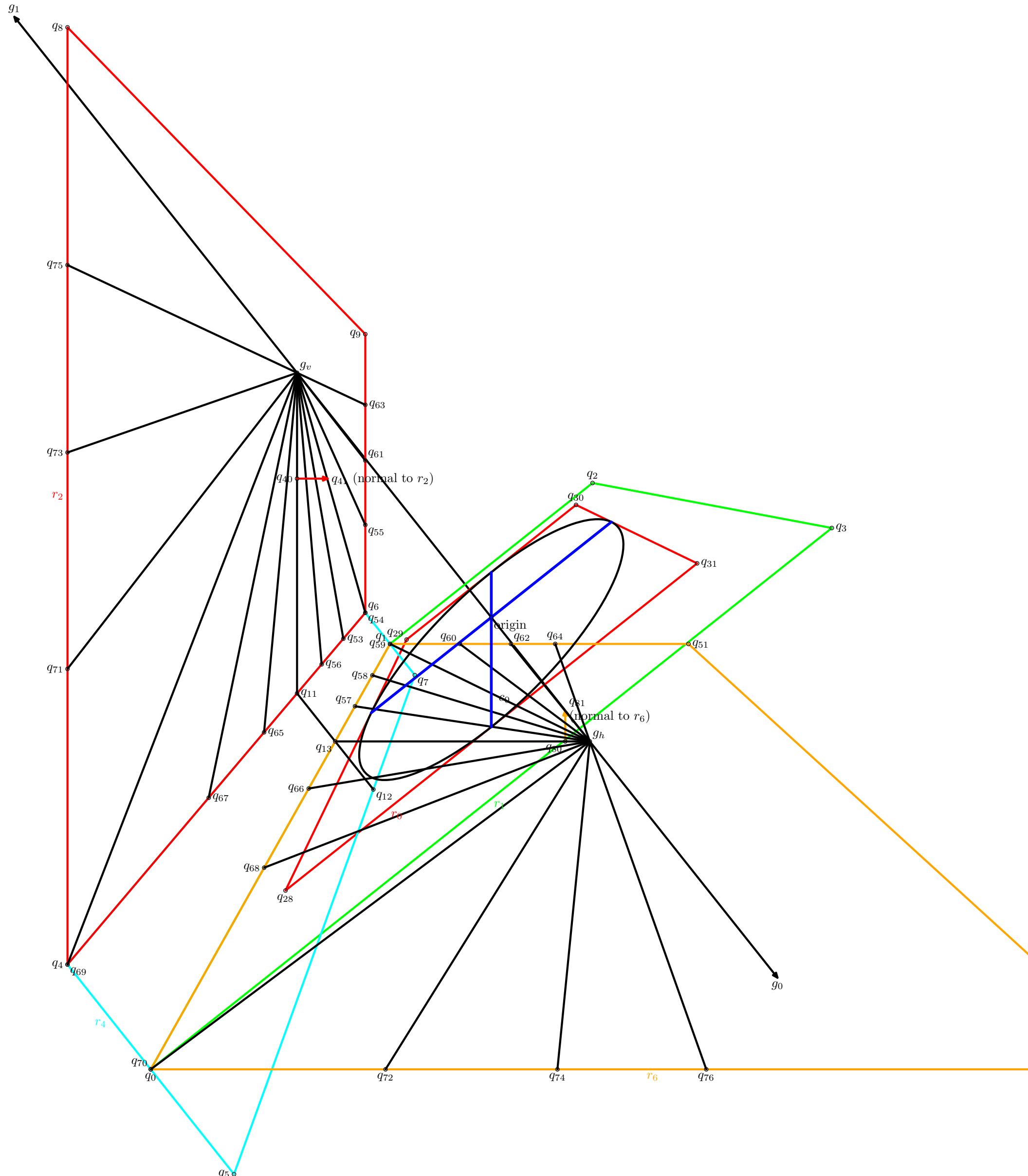
London, UK $51^{\circ} 30' 28''$ N, $0^{\circ} 7' 41''$ W

North



Parallel projection onto the horizontal plane (plane of r_6)
Horizontal dial
Latitude $51^{\circ} 30' 28''$ N (London, UK)

Göttingen, Germany 51° 32' N, 9° 56' E



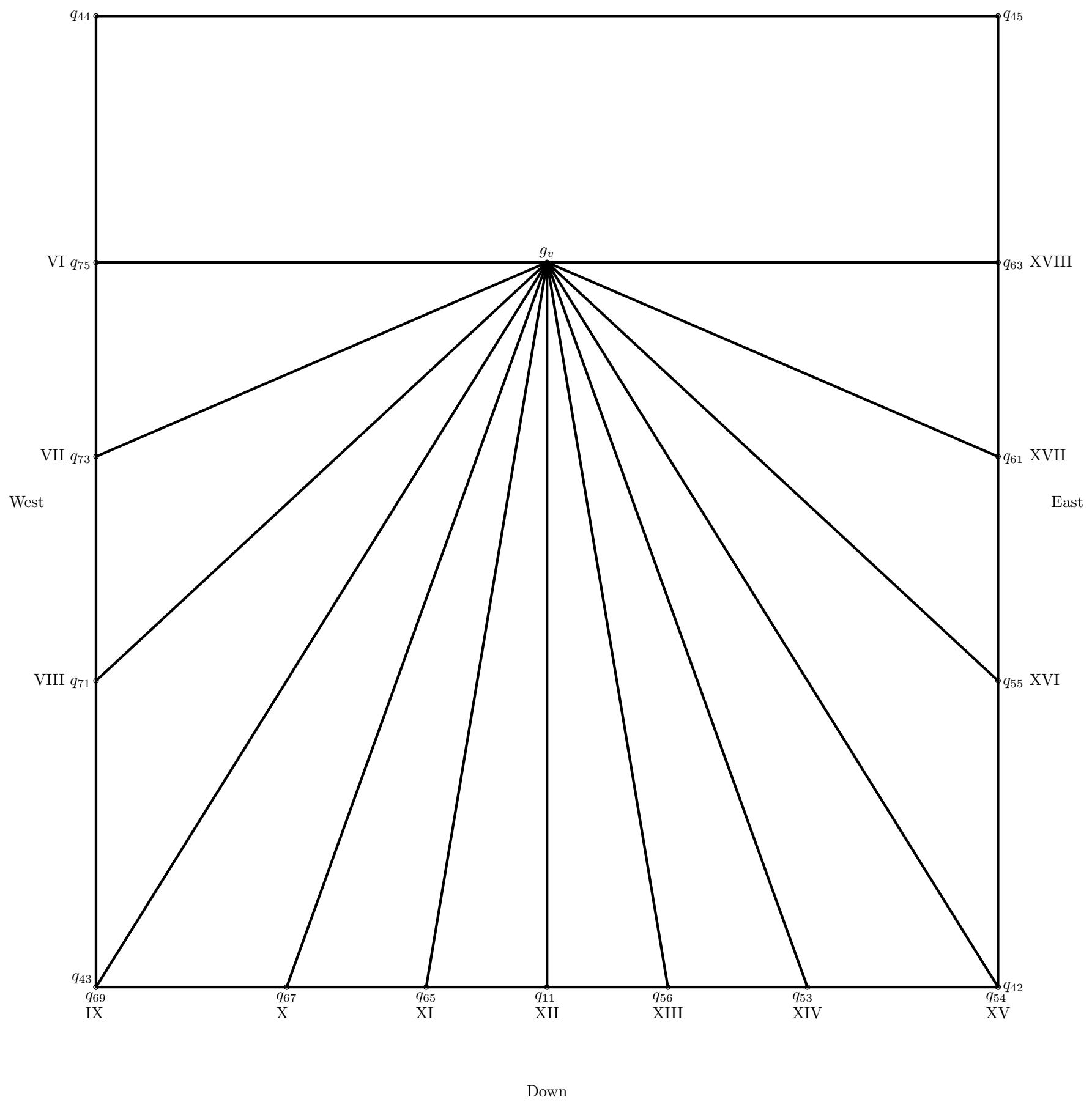
Perspective projection

Perspective projection

Latitude 51° 32' N (Göttingen, Germany)
Focus: position = (0, 5, -12), direction = (0, 5, 10), distance = 10
(dimensions in centimeters)

Göttingen, Germany $51^\circ 32' N, 9^\circ 56' E$

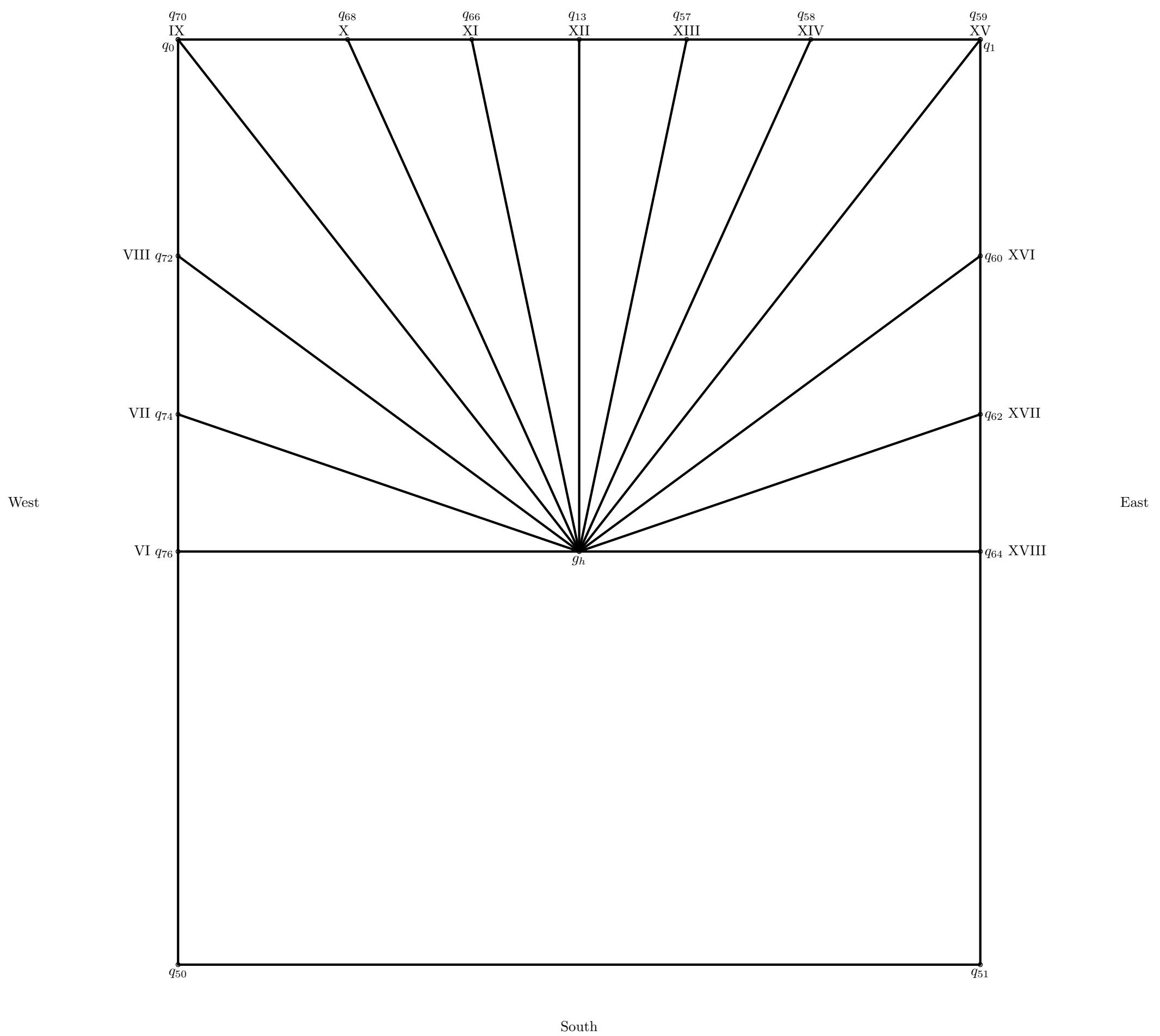
Up



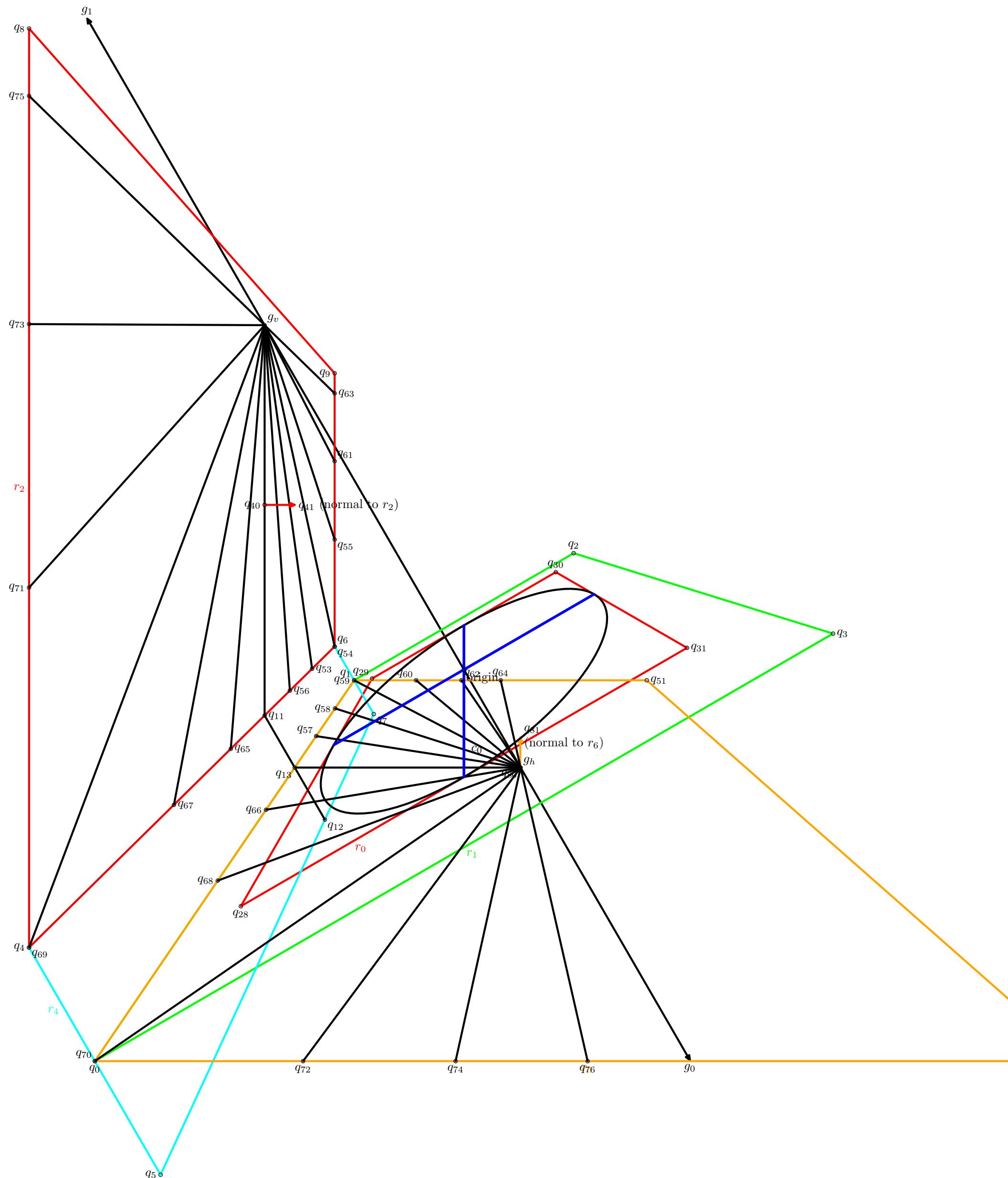
Parallel projection onto the vertical plane (plane of r_1)
Vertical dial facing due south
Latitude $51^\circ 32' N$ (Göttingen, Germany)

Göttingen, Germany $51^\circ 32' \text{ N}$, $9^\circ 56' \text{ E}$

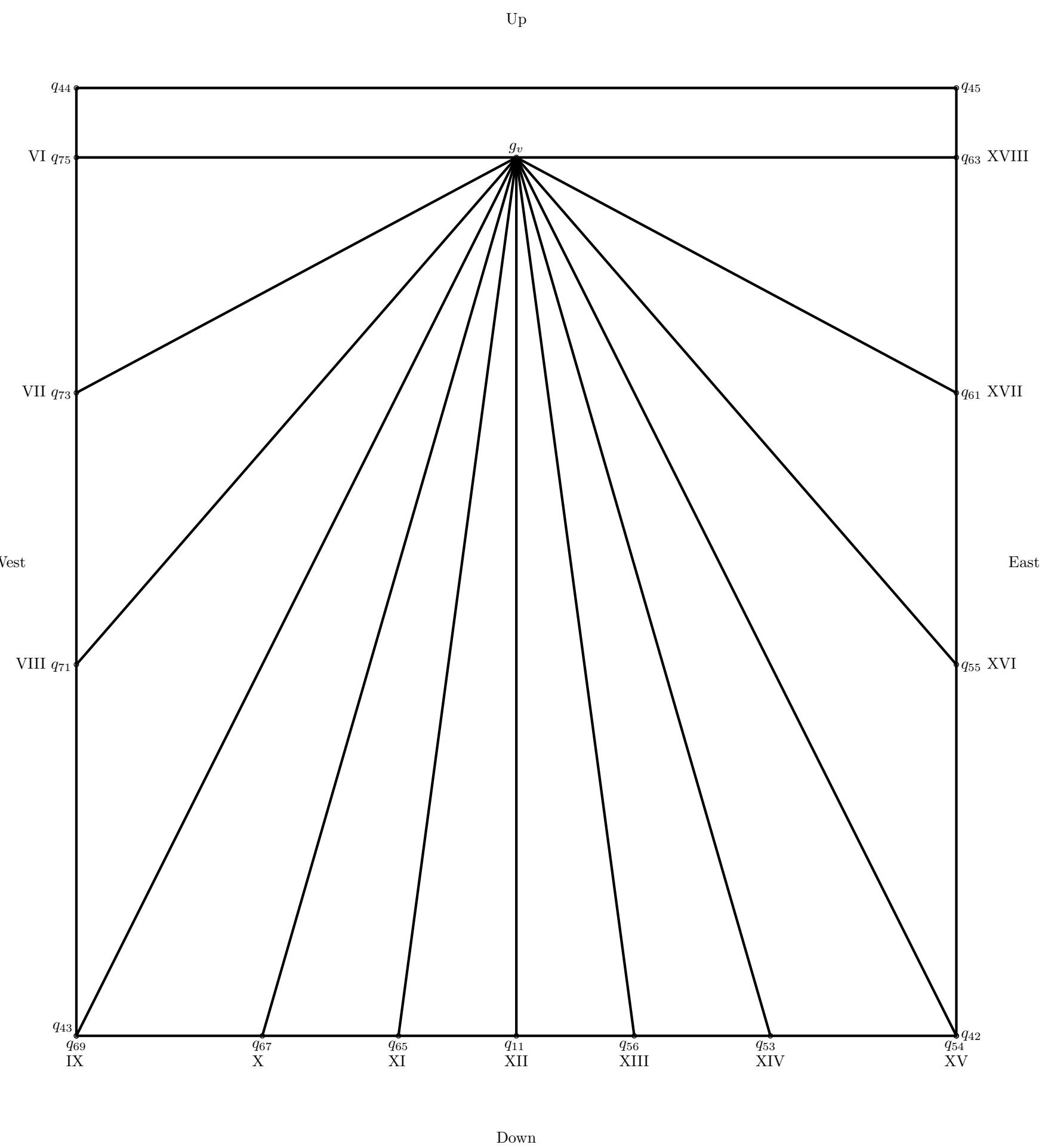
North



Parallel projection onto the horizontal plane (plane of r_6).
Horizontal dial
Latitude $51^\circ 32' \text{ N}$ (Göttingen, Germany)

St. Petersburg, Russia $59^{\circ} 56' N, 30^{\circ} 20' E$ **Perspective projection**St. Petersburg, Russia $59^{\circ} 56' N, 30^{\circ} 20' E$ Focus: position = $(0, 5, -12)$, direction = $(0, 5, 10)$, distance = 10
(dimensions in centimeters)

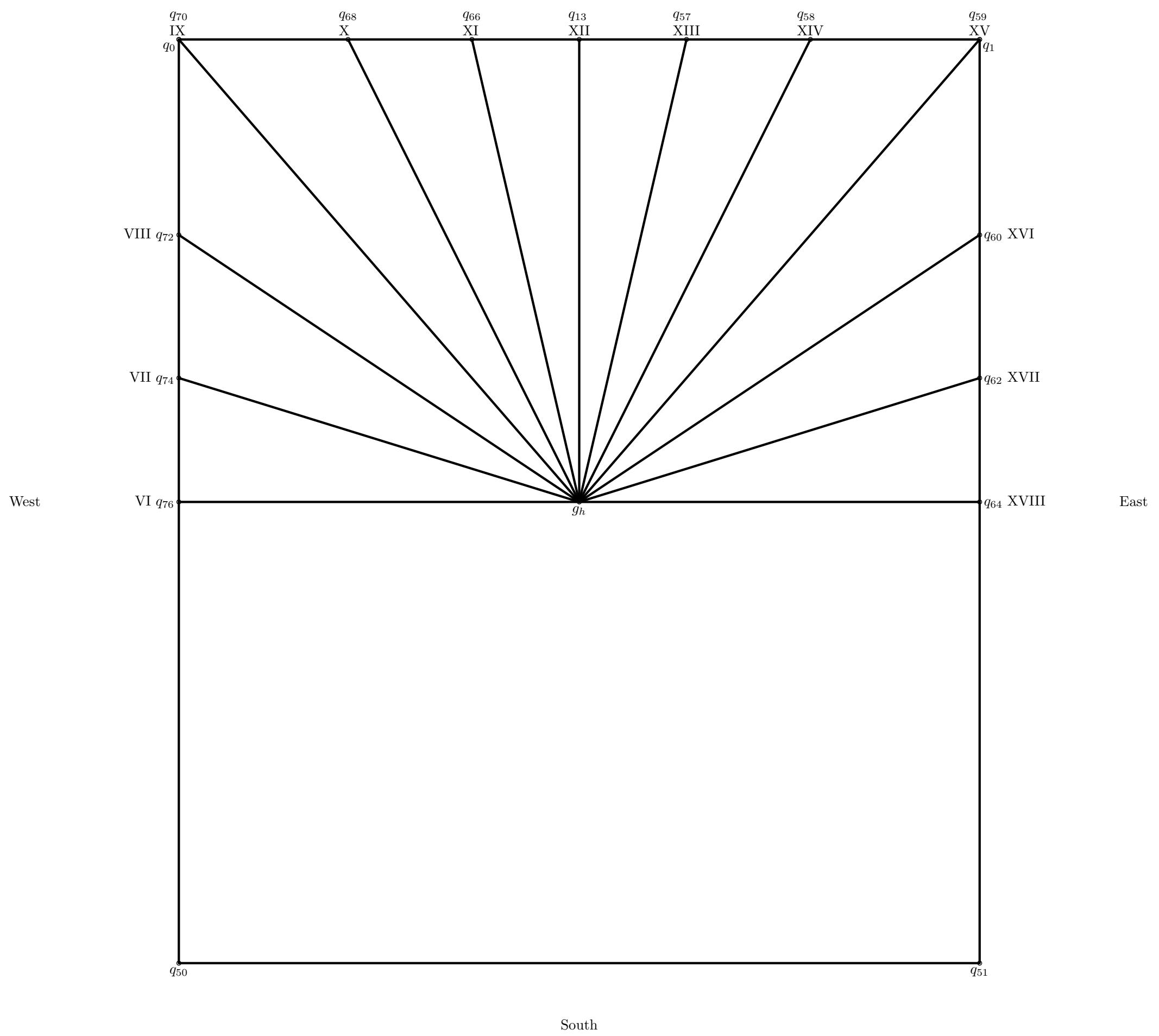
St. Petersburg, Russia $59^{\circ} 56' \text{ N}$, $30^{\circ} 20' \text{ E}$



Parallel projection onto the vertical plane (plane of r_1)
Vertical dial facing due south
St. Petersburg, Russia 59° 56' N, 30° 20' E

St. Petersburg, Russia $59^{\circ} 56' \text{ N}$, $30^{\circ} 20' \text{ E}$

North



Parallel projection onto the horizontal plane (plane of r_6).
 Horizontal dial
 St. Petersburg, Russia $59^{\circ} 56' \text{ N}$, $30^{\circ} 20' \text{ E}$