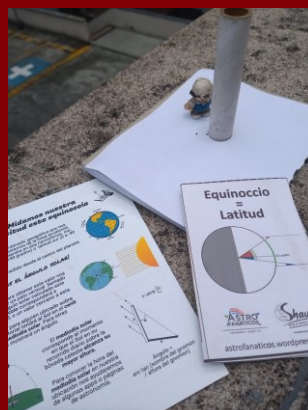
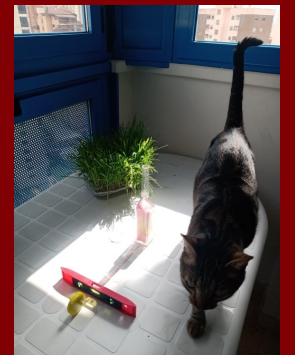
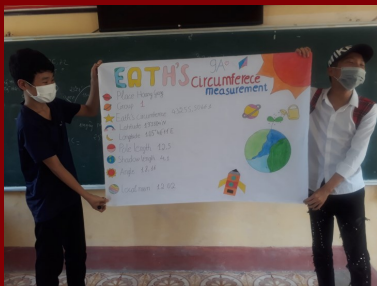
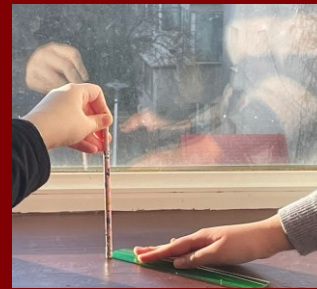
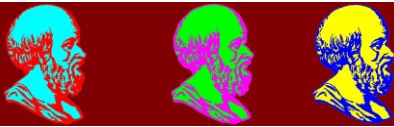




Eratosthenes March 2022 Equinox





Work process

To allow the participation of the largest number of schools, measurements are not only carried out on the day of the equinox, but also from 3 days before this date until 3 days after.

The measurement procedure is thus adapted, limiting the problems of bad weather conditions as well as the fact that the day of the equinox falls on a Sunday.

The collaborative measure

During these 7 days, the partner schools exchange the results of their measurements of the height of their gnomon and the length of its shadow at solar noon, which define the angle of the sun at that moment.

It is not necessary for these schools to be located on the same meridian: These measurements being synchronized at solar noon, it is indeed the distance between the parallels passing through these 2 schools which is used to calculate the circumference of the Earth.

The Eratosthenes historical method

The historical measurement of Eratosthenes took place during the summer solstice, with Syene (Tropic of Cancer) as a reference, ie the place where the Sun is at its zenith on this date. These conditions are also fulfilled on the day of the equinox for all places located on the equator.

Latitude and angle of the Sun

The measurements of March 20 but also those carried out during the week, thanks to a regression calculation, make it possible to verify that latitude and angle of the Sun are equal on the day of the equinox.



The collaborative measure

Partner schools



AMERICA



Argentina : Chivilcoy



Colombia : Guarne, Medellin



Puerto Rico : Bayamón



USA : Sault Sainte Marie

EUROPE



France : Montcuq



Greece : Aigio, Athens, Ilion, Stavraki



Poland : Siedlce



Romania : Barlad, Busteni, Malovat, Pogana, Slatina



Spain: Benidorm

AFRICA



Morocco : Tanger

ASIA



Vietnam : Hoằng Giang, Hồ Chí Minh City

Table of measurements.

City	Country	School	Latitude (+N/-S) decimal(°)	Longitude (+E/-W) decimal(°)	Date	Gnomon height [cm]	Shadow length [cm]	Angle (°)
Pogana	Romania	Școala Gimnaziala Pogana	46.313	27.575	17/03/2022	10.0	10.9	47.5
Montcuq	France	Fondation La main à la pâte	44.340	1.210	17/03/2022	12.5	12.7	45.5
Stavraki	Greece	Primary School of Stavraki	39.654	20.817	17/03/2022	27.0	23.0	40.4
Bayamón	Puerto Rico	AECM Carribean University	18.383	-66.168	17/03/2022	25.0	8.5	18.8
Guarne	Colombia	Grupo Astrofánaticos	6.274	-75.447	17/03/2022	15.2	1.9	7.1
Chivilcoy	Argentina	Parque Cielos del Sur	-34.911	-60.014	17/03/2022	12.0	-8.0	-33.7
Pogana	Romania	Școala Gimnaziala Pogana	46.313	27.575	18/03/2022	10.0	10.8	47.2
Busteni	Romania	Scoala Gimnaziala Sanatoriala	45.416	25.535	18/03/2022	50.0	52.3	46.3
Malovat	Romania	Scoala Gimnaziala Malovat	44.707	22.722	18/03/2022	100.0	102.0	45.6
Montcuq	France	Fondation La main à la pâte	44.340	1.210	18/03/2022	12.5	12.6	45.2
Chivilcoy	Argentina	Parque Cielos del Sur	-34.911	-60.014	18/03/2022	12.1	-8.2	-34.1
Busteni	Romania	Scoala Gimnaziala Sanatoriala	45.416	25.535	19/03/2022	22.3	23.0	45.9
Montcuq	France	Fondation La main à la pâte	44.340	1.210	19/03/2022	12.5	12.4	44.8
Chivilcoy	Argentina	Parque Cielos del Sur	-34.911	-60.014	19/03/2022	12.1	-8.3	-34.4
Sault Sainte Marie	USA	Lake Superior State University	46.458	-84.376	20/03/2022	8.0	8.5	46.7
Pogana	Romania	Școala Gimnaziala Pogana	46.313	27.575	20/03/2022	30.0	31.5	46.4
Barlad	Romania	Scoala Gimnaziala Episcop Iacov Antonovici	46.234	27.669	20/03/2023	10.0	10.5	46.3
Busteni	Romania	Scoala Gimnaziala Sanatoriala	45.416	25.535	20/03/2022	29.5	30.0	45.5
Slatina	Romania	Secondary School Vlaicu Voda	44.432	24.377	20/03/2023	100.0	97.3	44.2
Montcuq	France	Fondation La main à la pâte	44.340	1.210	20/03/2022	12.5	12.2	44.3
Stavraki	Greece	Primary School of Stavraki	39.654	20.817	20/03/2022	100.0	83.5	39.9
Benidorm	Spain	Fundacion Caminos de Anisacate	38.541	0.124	20/03/2022	26.0	20.5	38.3
Aigio	Greece	1st High School of Aigio	38.252	22.079	20/03/2022	27.0	21.0	37.9
Ilion	Greece	11th Junior High School of Ilion	38.033	23.697	20/03/2022	40.0	31.1	37.9
Bayamón	Puerto Rico	AECM Carribean University	18.383	-66.168	20/03/2022	25.0	8.3	18.4
Hồ Chi Minh City	Vietnam	Nguyen Trai High School	10.759	106.669	20/03/2022	108.0	20.5	10.7
Medellin	Colombia	Grupo Astrofánaticos	6.200	-75.602	20/03/2022	7.5	0.8	6.1
Chivilcoy	Argentina	Parque Cielos del Sur	-34.911	-60.014	20/03/2022	11.9	-8.3	-34.9
Siedlce	Poland	1st Secondary School of Bolesław Prus	52.167	22.282	21/03/2022	57.0	70.5	51.0
Busteni	Romania	Scoala Gimnaziala Sanatoriala	45.416	25.535	21/03/2022	36.9	37.0	45.1
Malovat	Romania	Scoala Gimnaziala Malovat	44.707	22.722	21/03/2022	33.0	32.3	44.4
Slatina	Romania	Secondary School Vlaicu Voda	44.432	24.377	21/03/2022	30.0	29.2	44.2
Montcuq	France	Fondation La main à la pâte	44.340	1.210	21/03/2022	12.5	12.1	44.1
Stavraki	Greece	Primary School of Stavraki	39.654	20.817	21/03/2022	100.0	82.0	39.4
Aigio	Greece	1st High School of Aigio	38.252	22.079	21/03/2022	30.0	23.0	37.5
Athens	Greece	Experimental School Agion Anargyron	38.027	23.726	21/03/2022	49.0	37.5	37.4
Tanger	Morocco	Groupe scolaire Annour	35.783	-5.827	21/03/2022	122.5	82.0	33.8
Slatina	Romania	Secondary School Vlaicu Voda	44.432	24.377	22/03/2022	100.0	95.5	43.7
Montcuq	France	Fondation La main à la pâte	44.340	1.210	22/03/2022	12.5	11.9	43.6
Aigio	Greece	1st High School of Aigio	38.252	22.079	22/03/2022	30.0	23.1	37.6
Ilion	Greece	11th Junior High School of Ilion	38.033	23.697	22/03/2022	40.0	30.5	37.3
Hoàng Giang	Vietnam	Hoang Giang Secondary School	19.886	105.769	22/03/2022	12.5	4.1	18.2
Busteni	Romania	Scoala Gimnaziala Sanatoriala	45.416	25.535	23/03/2022	20.5	20.0	44.3
Slatina	Romania	Secondary School Vlaicu Voda	44.432	24.377	23/03/2022	100.0	94.1	43.3
Montcuq	France	Fondation La main à la pâte	44.340	1.210	23/03/2022	12.5	11.8	43.3

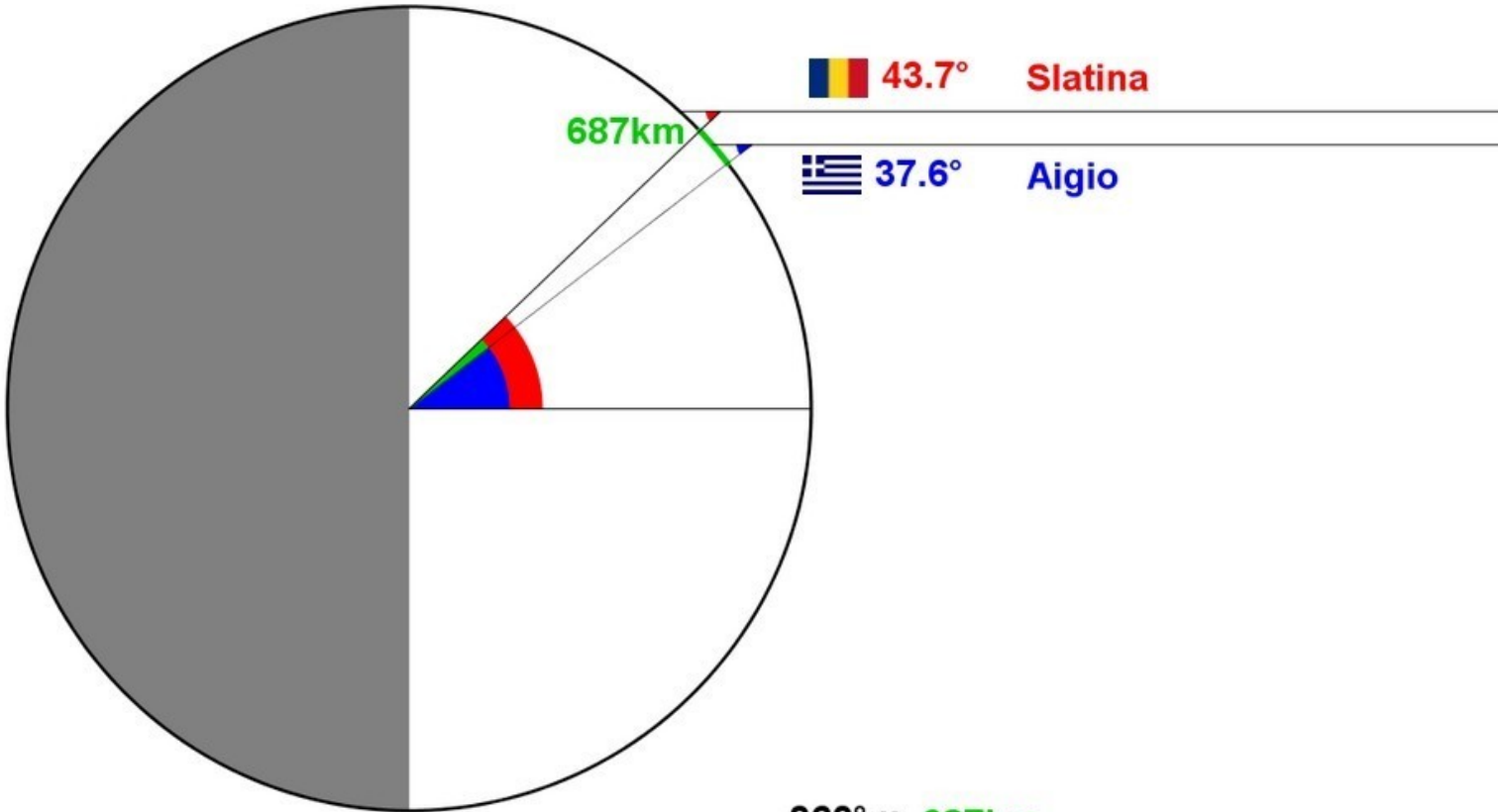
Aigio Greece

1st High School of Aigio
38.252 N 22.079 E

Date	Gnomon height [cm]	Shadow length [cm]	Angle (°)
20/03/2022	27.0	21.0	37.9
21/03/2022	30.0	23.0	37.5
22/03/2022	30.0	23.1	37.6

22/03/2022 (Slatina-Romania) Latitude: 44.432°

22/03/2022 (Aigio-Greece) Latitude: 38.252°



Distance	Angle
circumference	360°
687km	43.7° - 37.6°

circumference = $\frac{360^\circ \times 687\text{km}}{43.7^\circ - 37.6^\circ} = 40544 \text{ km}$



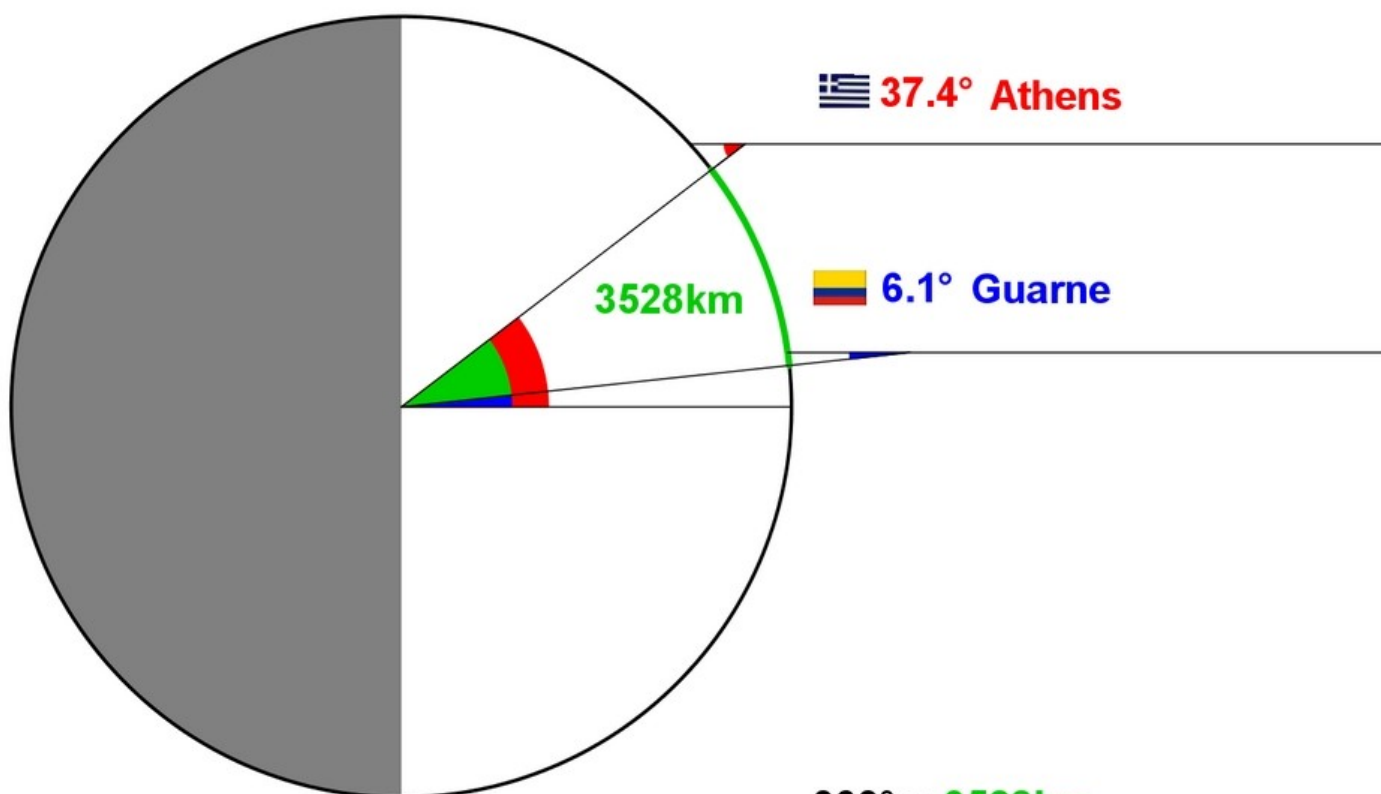
Athens Greece

Experimental School
Agion Anargyron
38.027 N 23.726 E

Date	Gnomon height [cm]	Shadow length [cm]	Angle (°)
21/03/2022	49.0	37.5	37.4

21/03/2022 (Athens-Greece) Latitude: 38.027°

21/03/2022 (Guarne-Colombia) Latitude: 6.274°



Distance	Angle
circumference	360°
3528km	37.4° - 6.1°

$$\text{circumference} = \frac{360^\circ \times 3528\text{km}}{37.4^\circ - 6.1^\circ} = 40578 \text{ km}$$

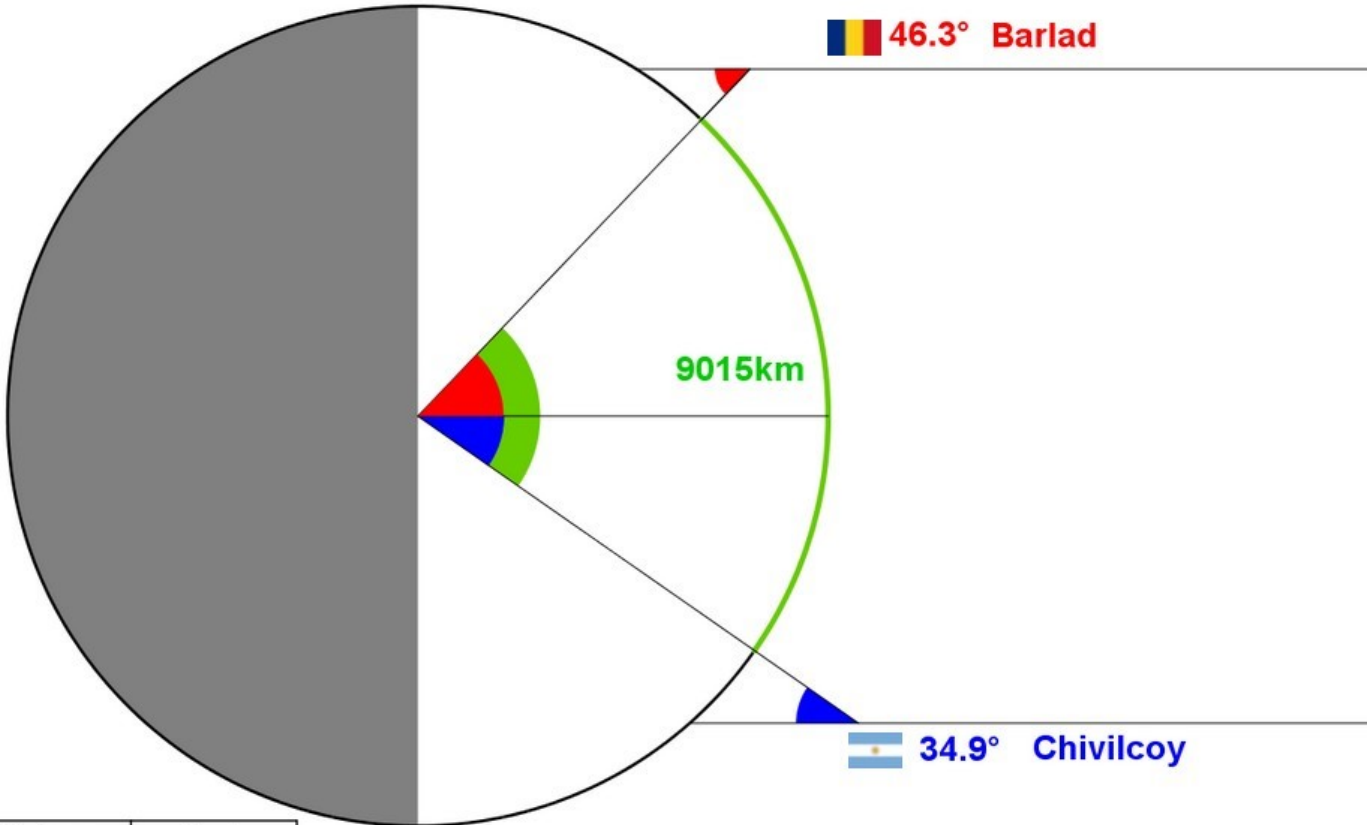


Barlad Romania

Scoala Gimnaziala
Episcop Iacov Antonovici
46.234 N 27.669 E

20/03/2023 (Barlad-Romania) Latitude: 46.234°
20/03/2022 (Chivilcoy-Argentina) Latitude: -34.911°

Date	Gnomon height [cm]	Shadow length [cm]	Angle (°)
20/03/2023	10.0	10.5	46.3



Distance	Angle
circumference	360°
9015km	46.3° + 34.9°

circumference = $\frac{360^\circ \times 9015\text{km}}{46.3^\circ + 34.9^\circ} = 39968 \text{ km}$



Bayamón

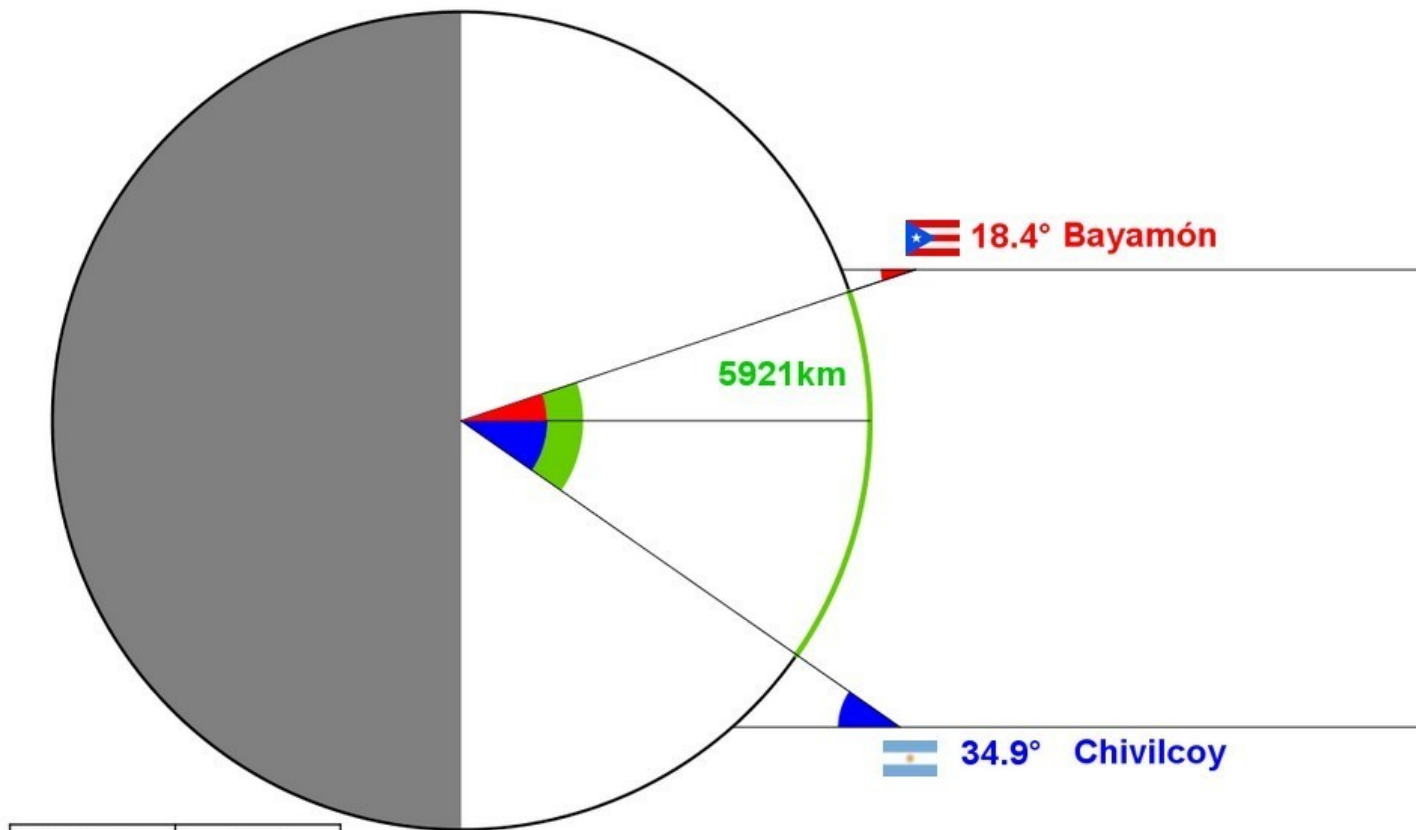
Puerto Rico

AECM Carribean University
18.383 N 66.168 W

Date	Gnomon height [cm]	Shadow length [cm]	Angle (°)
17/03/2022	25.0	8.5	18.8
20/03/2022	25.0	8.3	18.4

20/03/2022 (Bayamón-Puerto Rico) Latitude: 18.383°

20/03/2022 (Chivilcoy-Argentina) Latitude: -34.911°



Distance	Angle
circumference	360°
5921km	18.4° + 34.9°

circumference = $\frac{360^\circ \times 5921\text{km}}{18.4^\circ + 34.9^\circ} = 39992 \text{ km}$



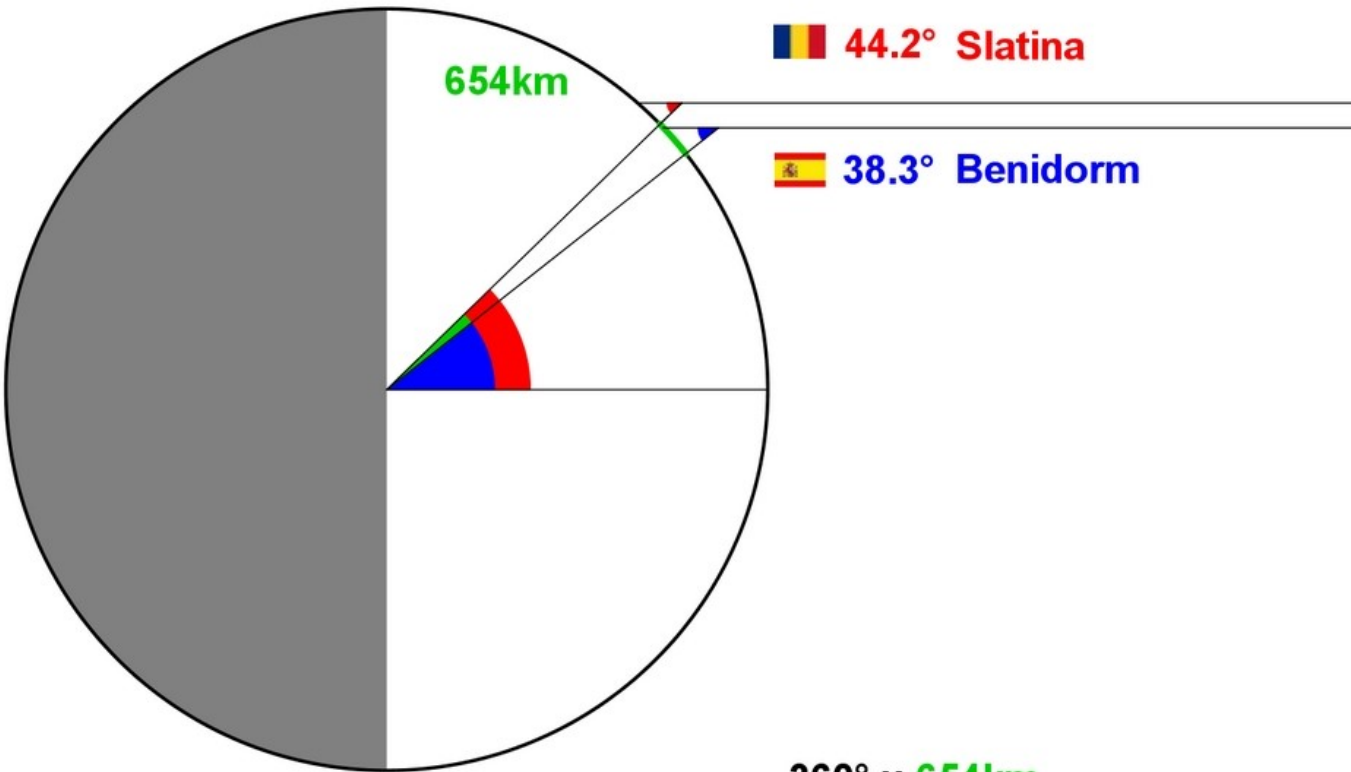
Benidorm Spain

Fundacion Caminos de Anisacate
38.541 N 0.124 W

Date	Gnomon height [cm]	Shadow length [cm]	Angle (°)
20/03/2022	26.0	20.5	38.3

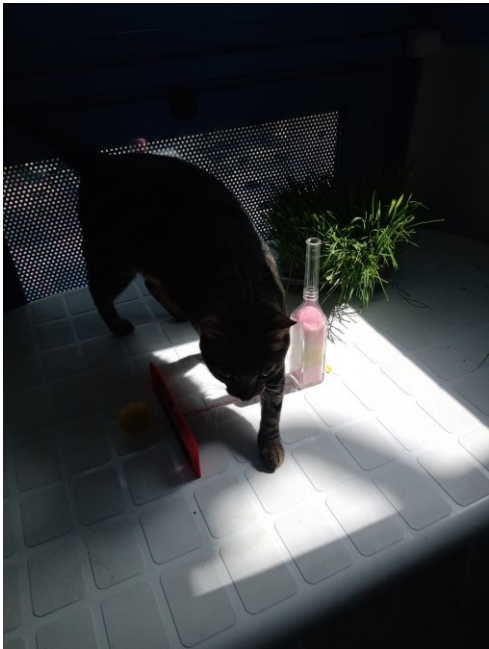
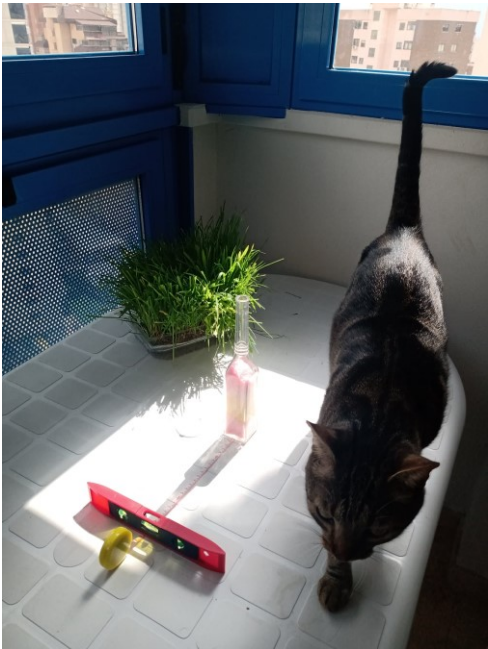
20/03/2023 (Slatina-Romania) Latitude: 44.432°

20/03/2022 (Benidorm-Spain) Latitude: 38.541°



Distance	Angle
circumference	360°
654km	44.2° - 38.3°

circumference = $\frac{360^\circ \times 654\text{km}}{44.2^\circ - 38.3^\circ} = 39905 \text{ km}$



Busteni

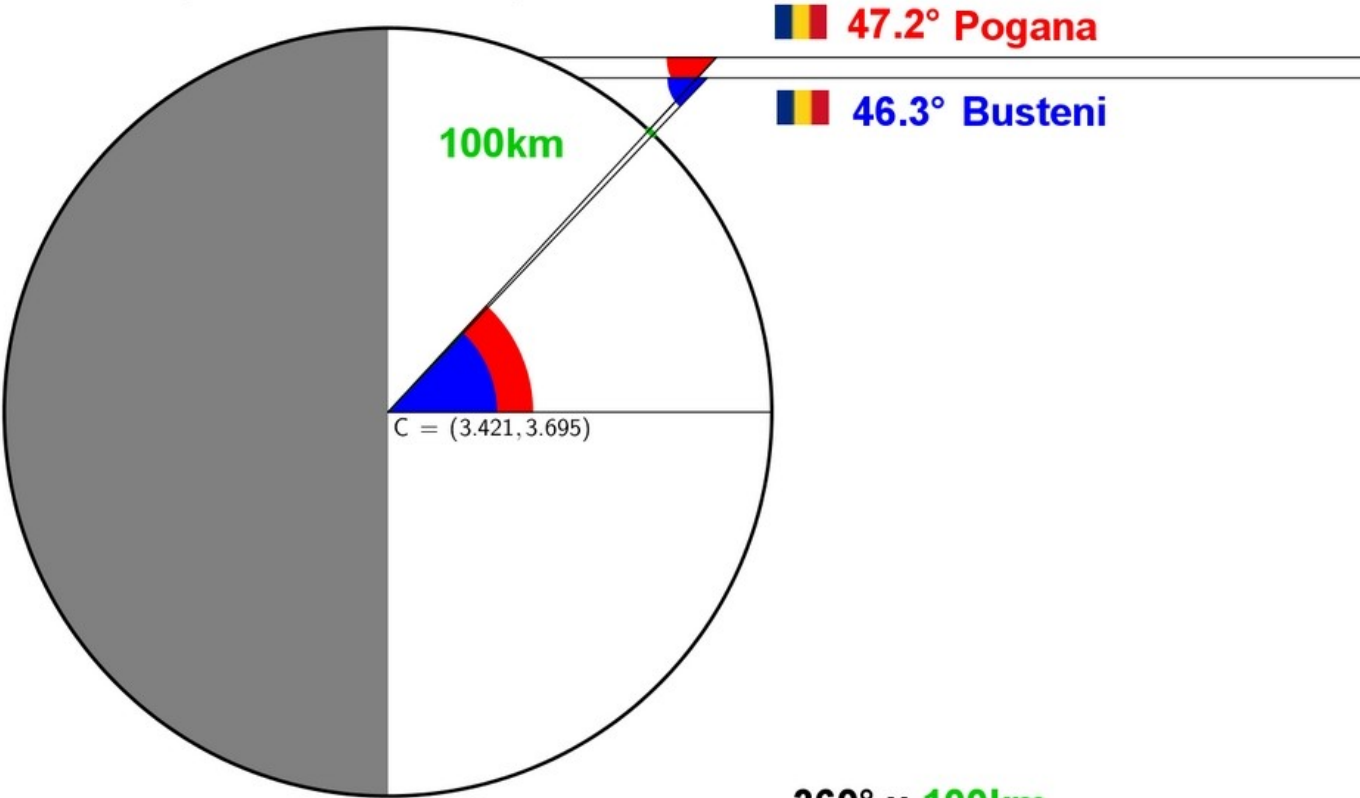
Romania

Scoala Gimnaziala Sanatoriala
 45.416 N 25.535 E

Date	Gnomon height [cm]	Shadow length [cm]	Angle (°)
18/03/2022	50.0	52.3	46.3
19/03/2022	22.3	23.0	45.9
20/03/2022	29.5	30.0	45.5
21/03/2022	36.9	37.0	45.1
23/03/2022	20.5	20.0	44.3

18/03/2022 (Pogana-Romania) Latitude: 46.313°

18/03/2022 (Busteni-Romania) Latitude: 45.416°



Distance	Angle
circumference	360°
100km	47.2° - 46.3°

$$\text{circumference} = \frac{360^\circ \times 100\text{km}}{47.2^\circ - 46.3^\circ} = 40000 \text{ km}$$



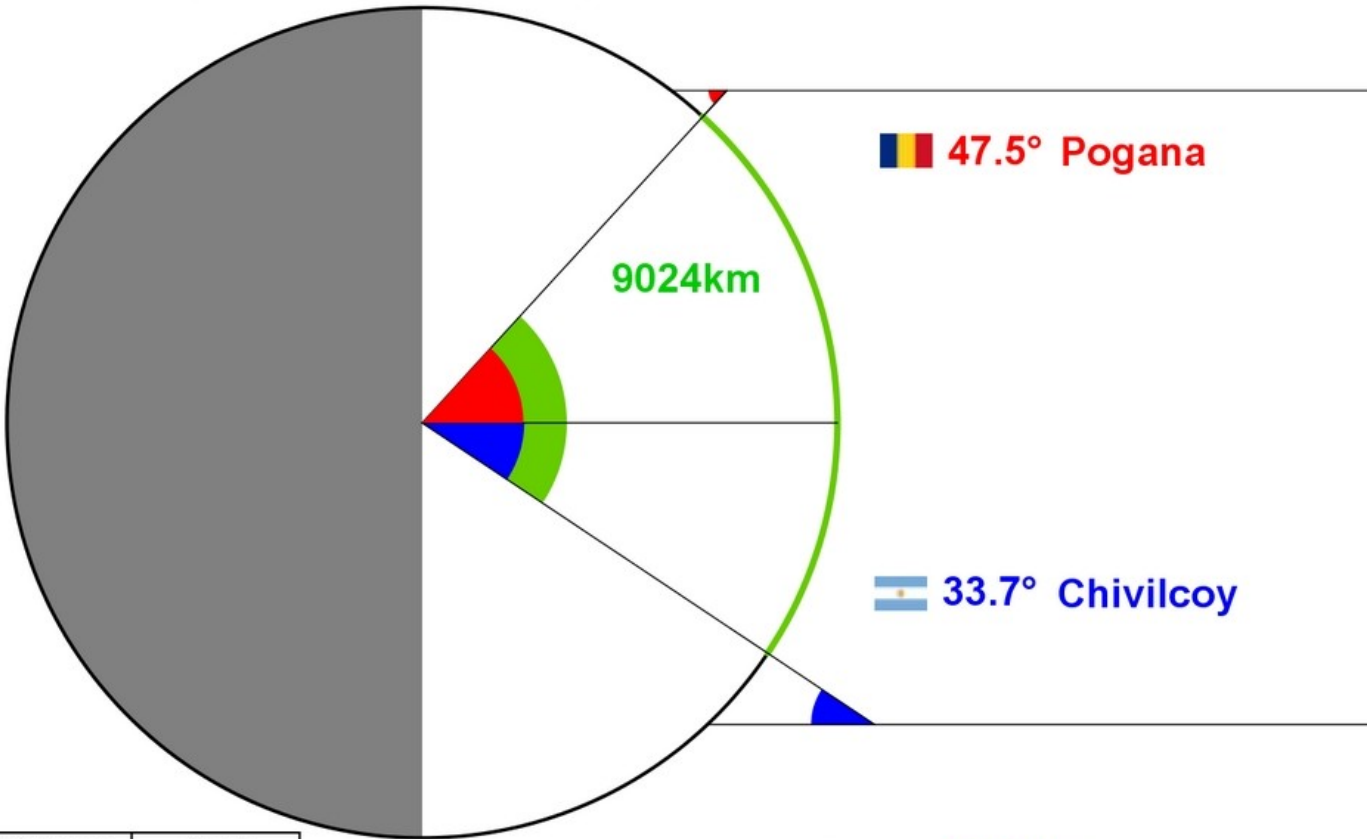
Chivilcoy Argentina

Parque Cielos del Sur
34.911 S 60.014 W

Date	Gnomon height [cm]	Shadow length [cm]	Angle (°)
17/03/2022	12.0	-8.0	-33.7
18/03/2022	12.1	-8.2	-34.1
19/03/2022	12.1	-8.3	-34.4
20/03/2022	11.9	-8.3	-34.9

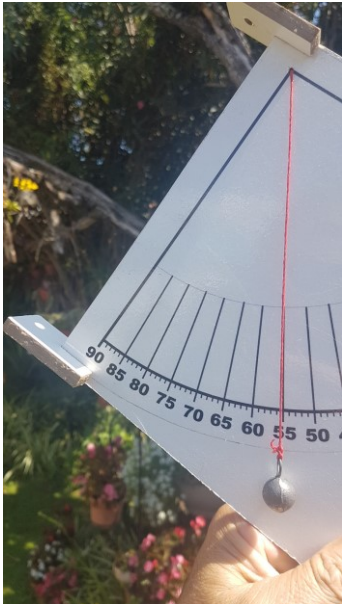
17/03/2022 (Pogana-Romania) Latitude: 46.313°

17/03/2022 (Chivilcoy-Argentina) Latitude: -34.911°



Distance	Angle
circumference	360°
9024km	47.5° + 33.7°

circumference = $\frac{360^\circ \times 9024\text{km}}{47.5^\circ + 33.7^\circ} = 40008 \text{ km}$



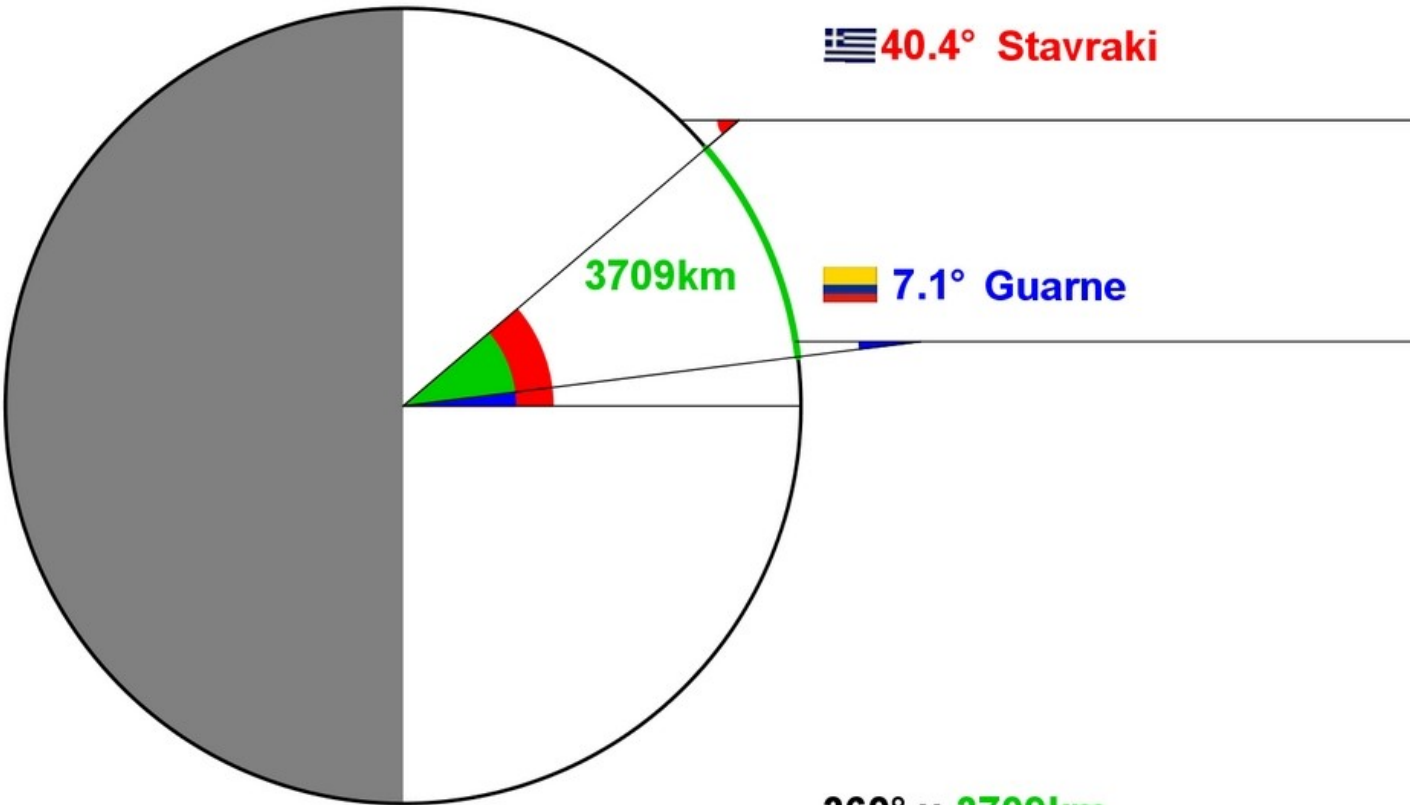
Guarne Colombia

Grupo Astrofánaticos
6.274 N 75.447 W

Date	Gnomon height [cm]	Shadow length [cm]	Angle (°)
17/03/2022	15.2	1.9	7.1

17/03/2022 (Stavraki-Greece) Latitude: 39.654°

17/03/2022 (Guarne-Colombia) Latitude: 6.274°



Distance	Angle
circumference	360°
3709km	40.4° - 7.1°

circumference = $\frac{360^\circ \times 3709\text{km}}{40.4^\circ - 7.1^\circ} = 40097 \text{ km}$

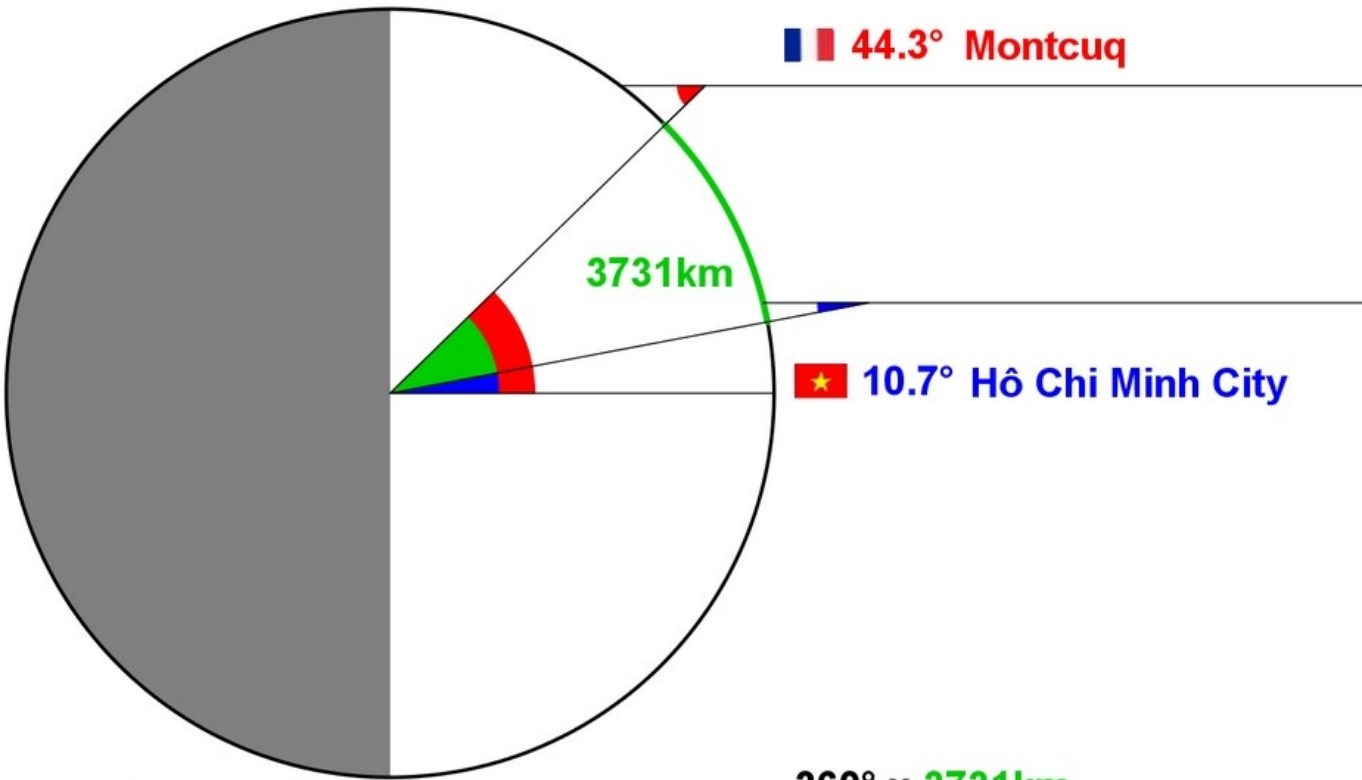


Hồ Chí Minh City Vietnam

Nguyen Trai High School
10.759 N 106.669 E

Date	Gnomon height [cm]	Shadow length [cm]	Angle (°)
20/03/2022	108.0	20.5	10.7

20/03/2022 (Montcuq-France) Latitude: 44.34°
20/03/2022 (Hồ Chí Minh City-Vietnam) Latitude: 10.759°



Distance	Angle
circumference	360°
3731km	44.3° - 10.7°

circumference = $\frac{360^\circ \times 3731\text{km}}{44.3^\circ - 10.7^\circ} = 39975 \text{ km}$



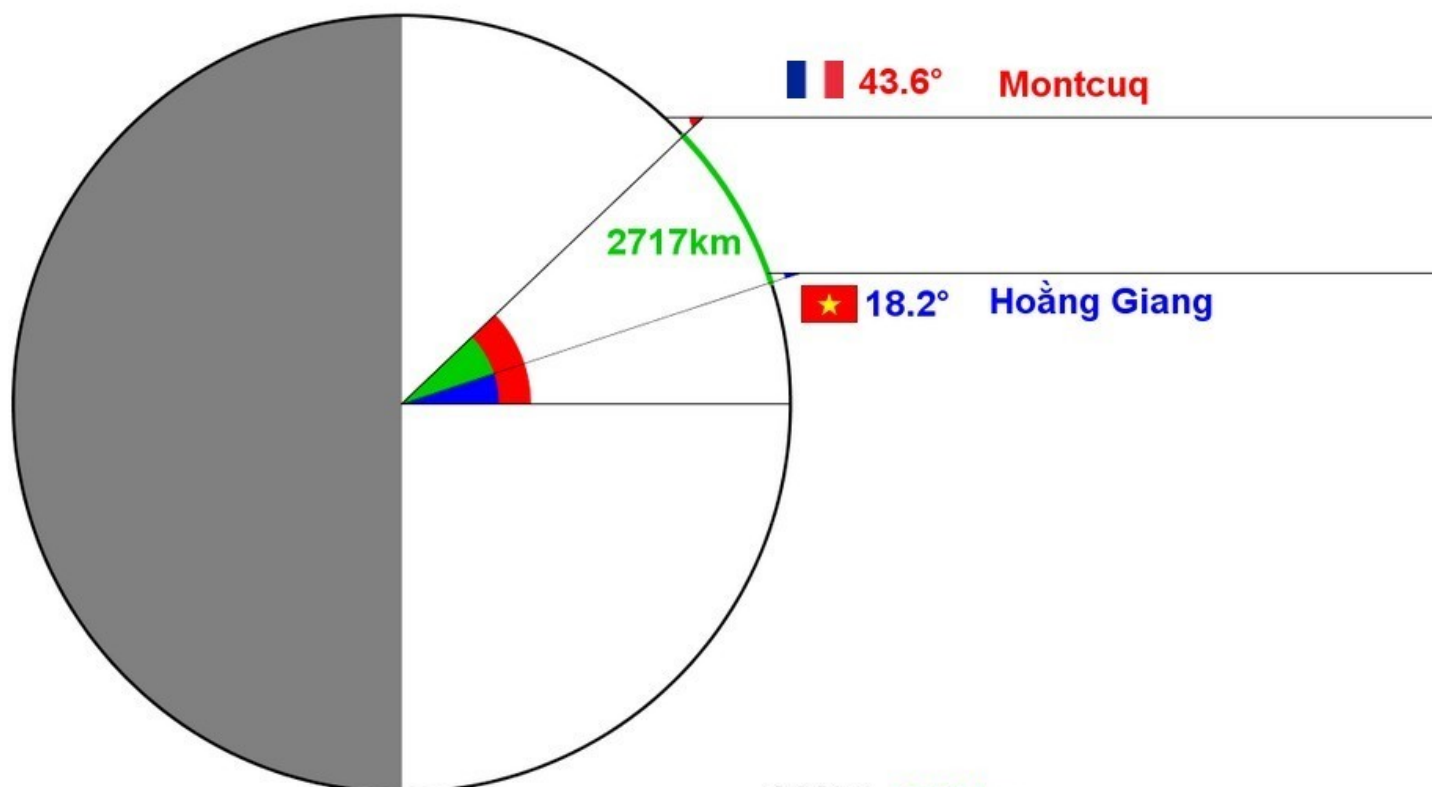
Hoàng Giang Vietnam

Hoang Giang Secondary School
19.886 N 105.769 E

Date	Gnomon height [cm]	Shadow length [cm]	Angle (°)
22/03/2022	12.5	4.1	18.2

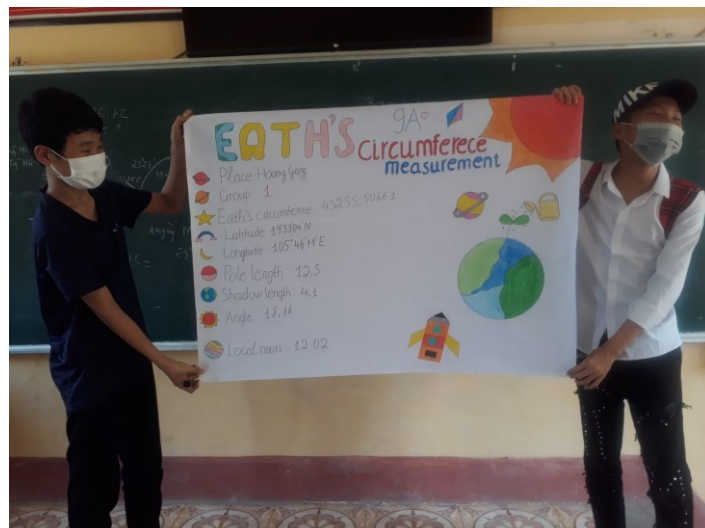
22/03/2022 (Montcuq-France) Latitude: 44.34°

22/03/2022 (Hoàng Giang-Việt Nam) Latitude: 19.886°



Distance	Angle
circumference	360°
2717km	43.6° - 18.2°

$$\text{circumference} = \frac{360^\circ \times 2717\text{km}}{43.6^\circ - 18.2^\circ} = 38509 \text{ km}$$



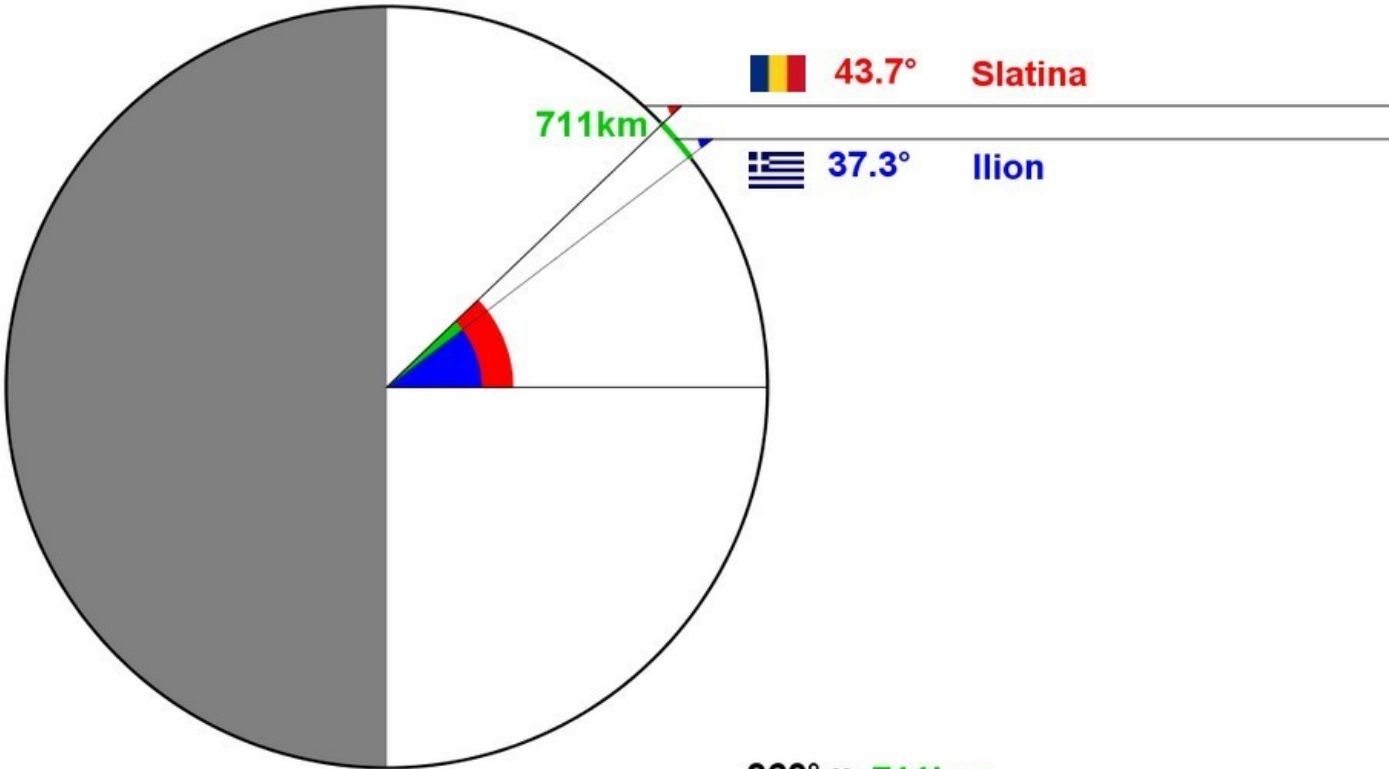
Ilion Greece

Hoang Giang Secondary School
19.886 N 105.769 E

Date	Gnomon height [cm]	Shadow length [cm]	Angle (°)
20/03/2022	40.0	31.1	37.9
22/03/2022	40.0	30.5	37.3

22/03/2022 (Slatina-Romania) Latitude: 44.432°

22/03/2022 (Ilion-Greece) Latitude: 38.033°



Distance	Angle
circumference	360°
711km	43.7° - 37.3°

$$\text{circumference} = \frac{360^\circ \times 711\text{km}}{43.7^\circ - 37.3^\circ} = 39994 \text{ km}$$

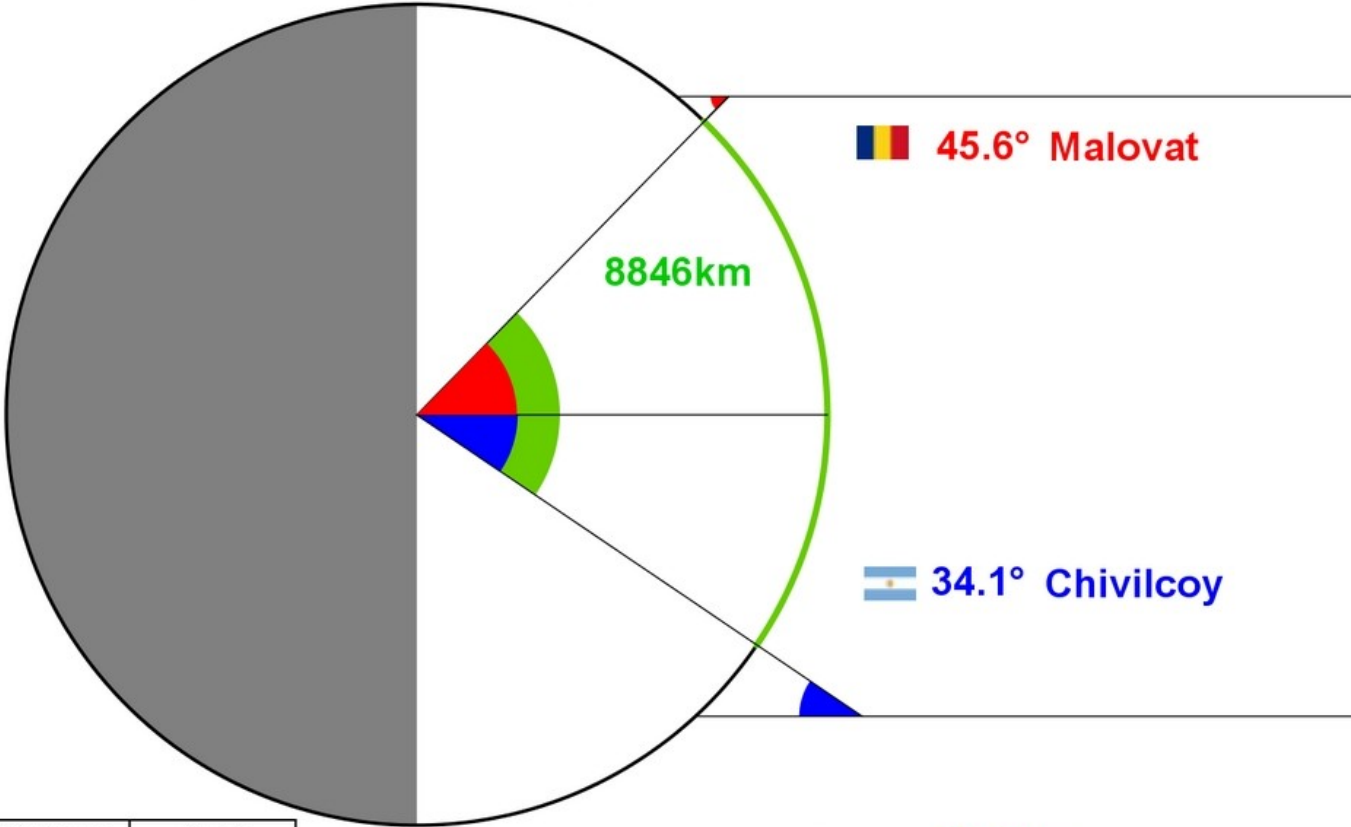


Malovat Romania

Scoala Gimnaziala Malovat
44.707 N 22.722 E

Date	Gnomon height [cm]	Shadow length [cm]	Angle (°)
18/03/2022	100.0	102.0	45.6
21/03/2022	33.0	32.3	44.4

18/03/2022 (Malovat-Romania) Latitude: 44.707°
18/03/2022 (Chivilcoy-Argentina) Latitude: -34.911°



Distance	Angle
circumference	360°
8846km	45.6° + 34.1°

circumference = $\frac{360^\circ \times 8846\text{km}}{45.6^\circ + 34.1^\circ} = 39957 \text{ km}$

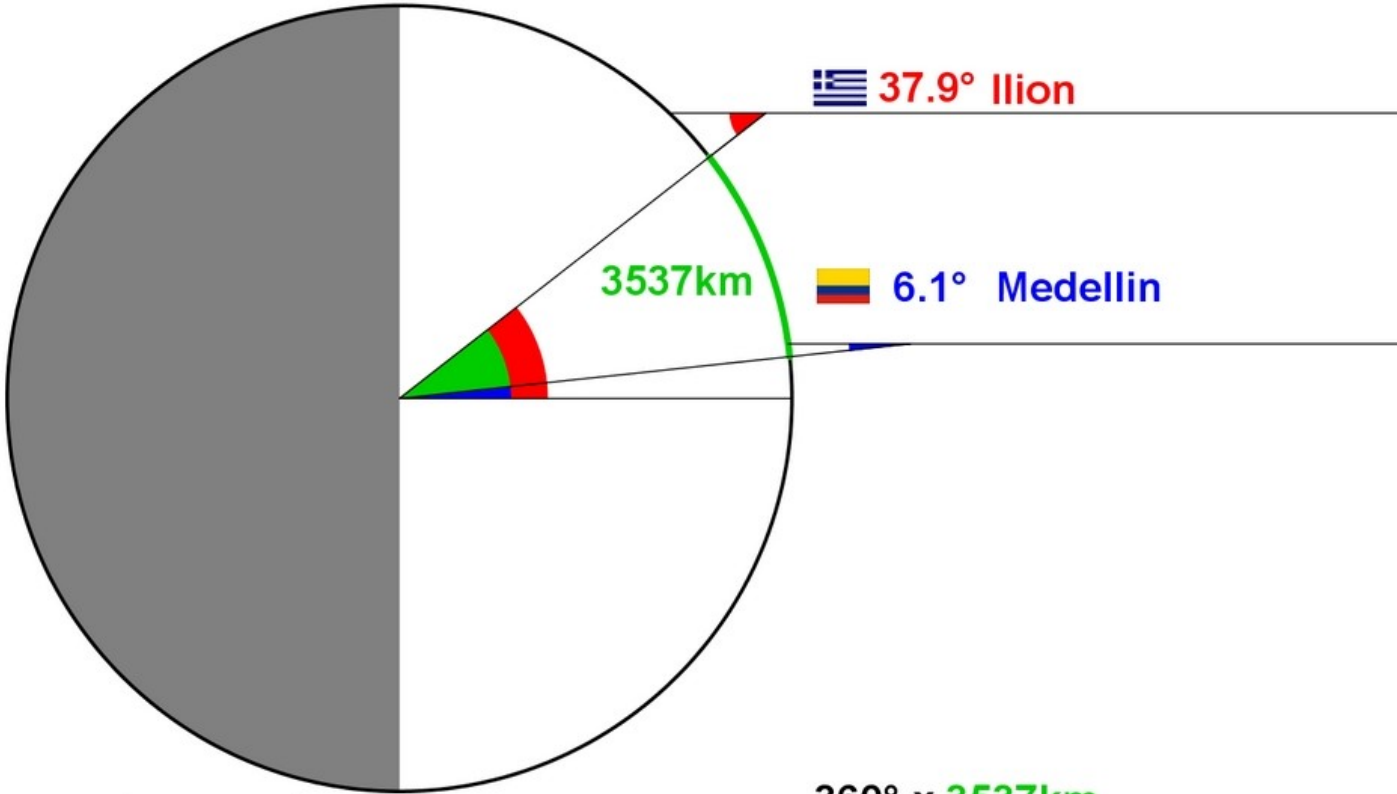


Medellin Colombia

Grupo Astrofánaticos
6.200 N 75.602 W

Date	Gnomon height [cm]	Shadow length [cm]	Angle (°)
20/03/2022	7.5	0.8	6.1

20/03/2022 (Ilion-Greece) Latitude: 38.033°
20/03/2022 (Medellin-Colombia) Latitude: 6.2°



Distance	Angle
circumference	360°
3537km	37.9° - 6.1°

circumference = $\frac{360^\circ \times 3537\text{km}}{37.9^\circ - 6.1^\circ} = 40042 \text{ km}$



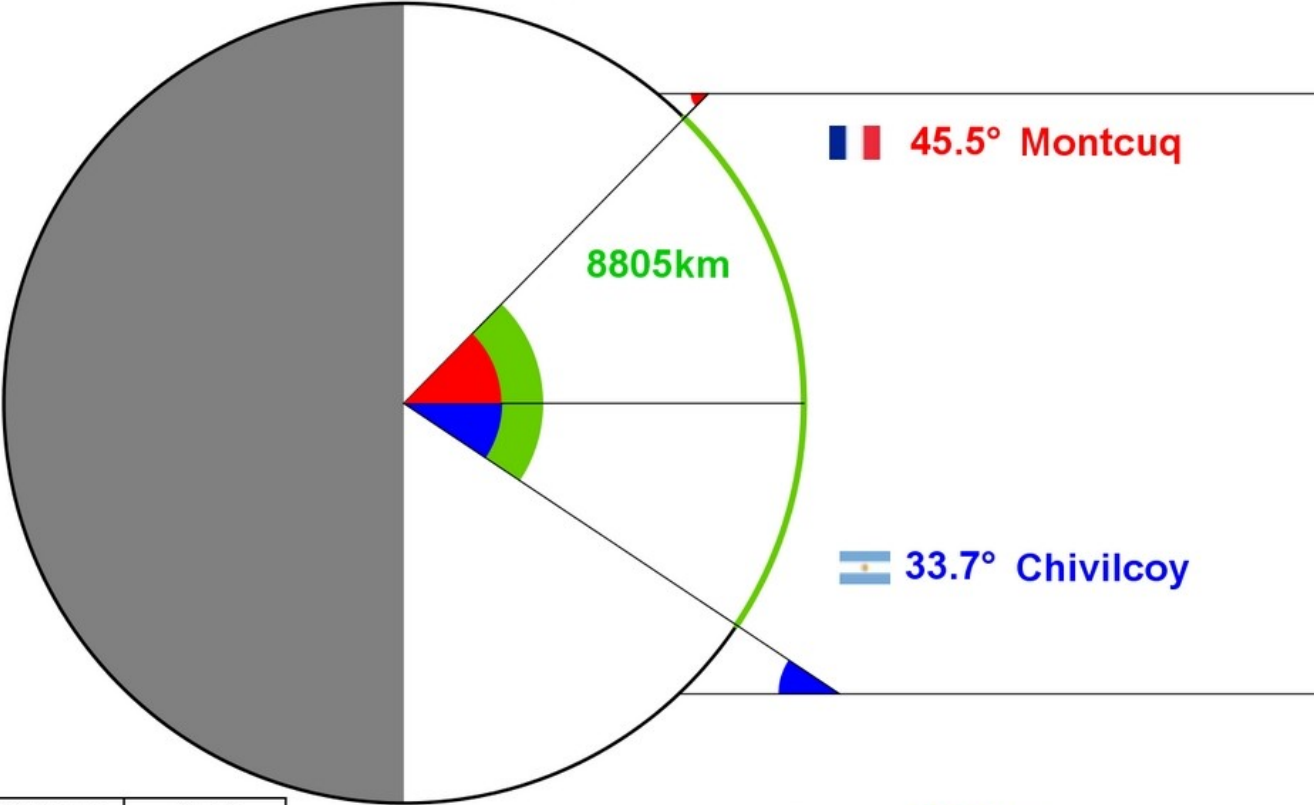
Montcuq France

Fondation La main à la pâte
44.340 N 1.210 E

Date	Gnomon height [cm]	Shadow length [cm]	Angle (°)
17/03/2022	12.5	12.7	45.5
18/03/2022	12.5	12.6	45.2
19/03/2022	12.5	12.4	44.8
20/03/2022	12.5	12.2	44.3
21/03/2022	12.5	12.1	44.1
22/03/2022	12.5	11.9	43.6
23/03/2022	12.5	11.8	43.3

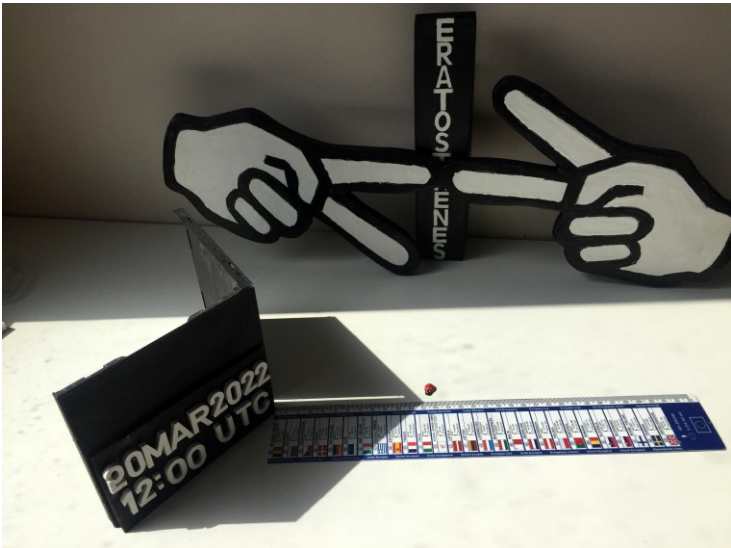
17/03/2022 (Montcuq-France) Latitude: 44.34°

17/03/2022 (Chivilcoy-Argentina) Latitude: -34.911°



Distance	Angle
circumference	360°
8805km	45.5° + 33.7°

circumference = $\frac{360^\circ \times 8805\text{km}}{45.5^\circ + 33.7^\circ} = 40023 \text{ km}$



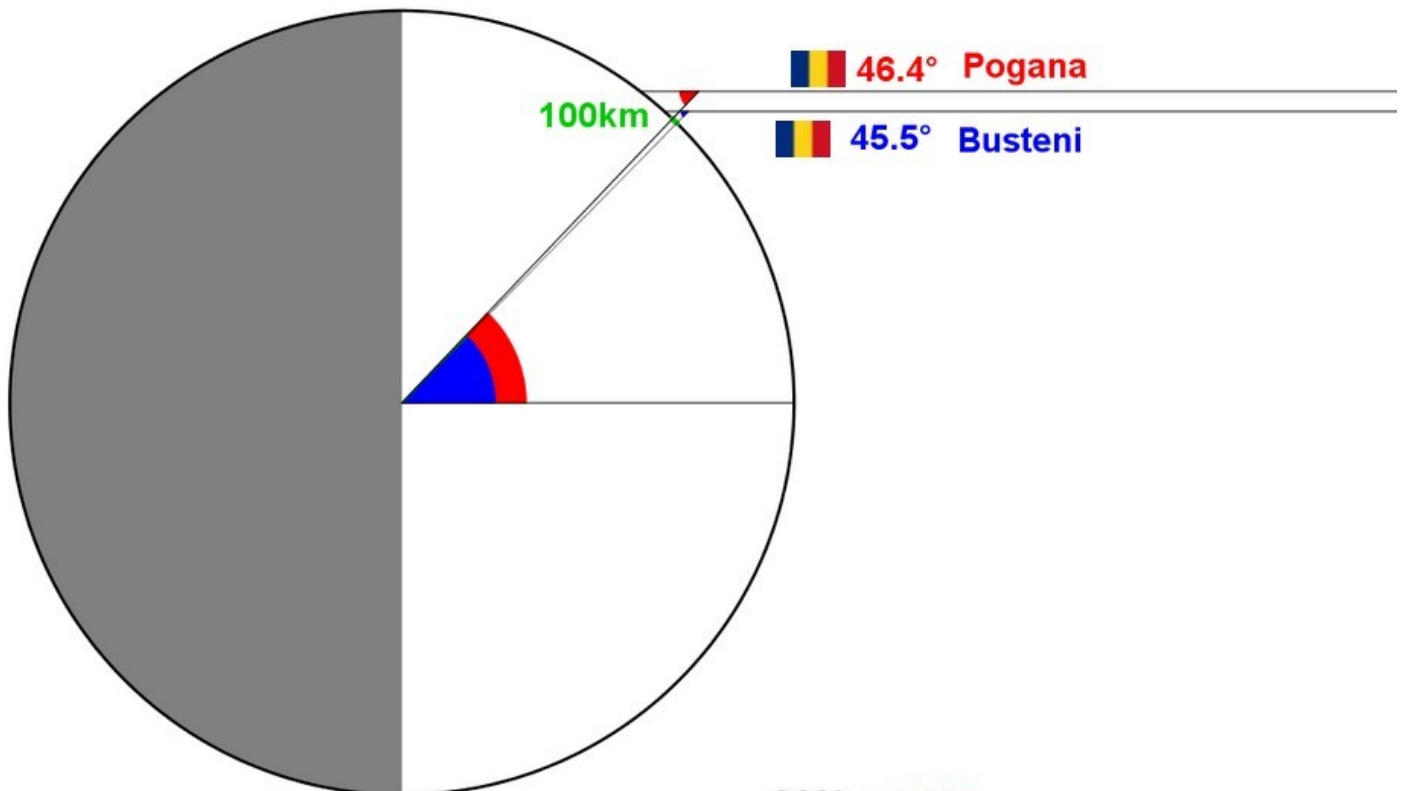
Pogana Romania

Școala Gimnaziala Pogana
46.313 N 27.575 E

Date	Gnomon height [cm]	Shadow length [cm]	Angle (°)
17/03/2022	10.0	10.9	47.5
18/03/2022	10.0	10.8	47.2
20/03/2022	30.0	31.5	46.4

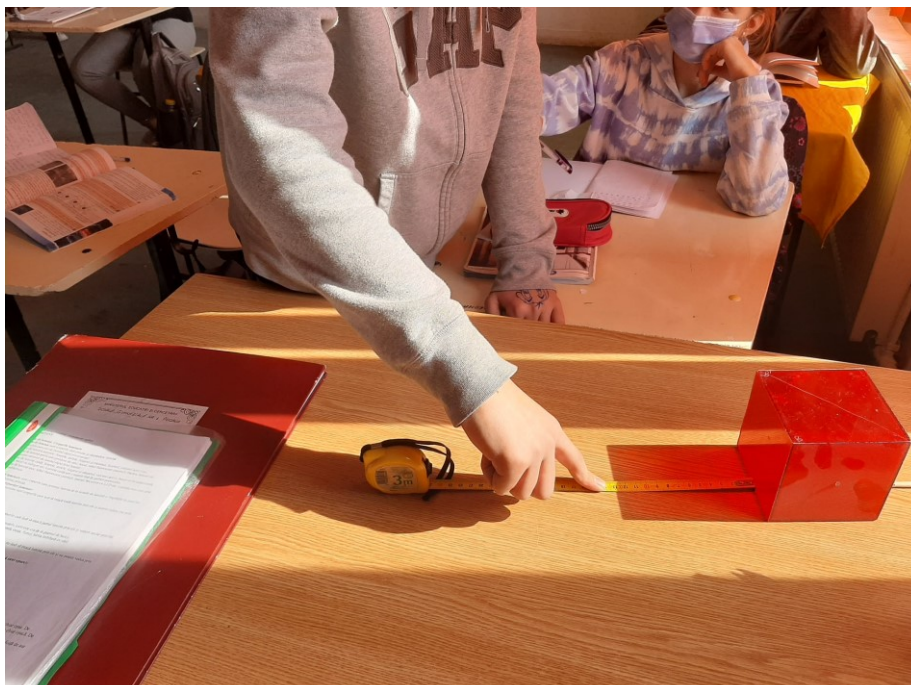
20/03/2022 (Pogana-Romania) Latitude: 46.313°

20/03/2022 (Busteni-Romania) Latitude: 45.416°



Distance	Angle
circumference	360°
100km	46.4° - 45.5°

$$\text{circumference} = \frac{360^\circ \times 100\text{km}}{46.4^\circ - 45.5^\circ} = 40000 \text{ km}$$



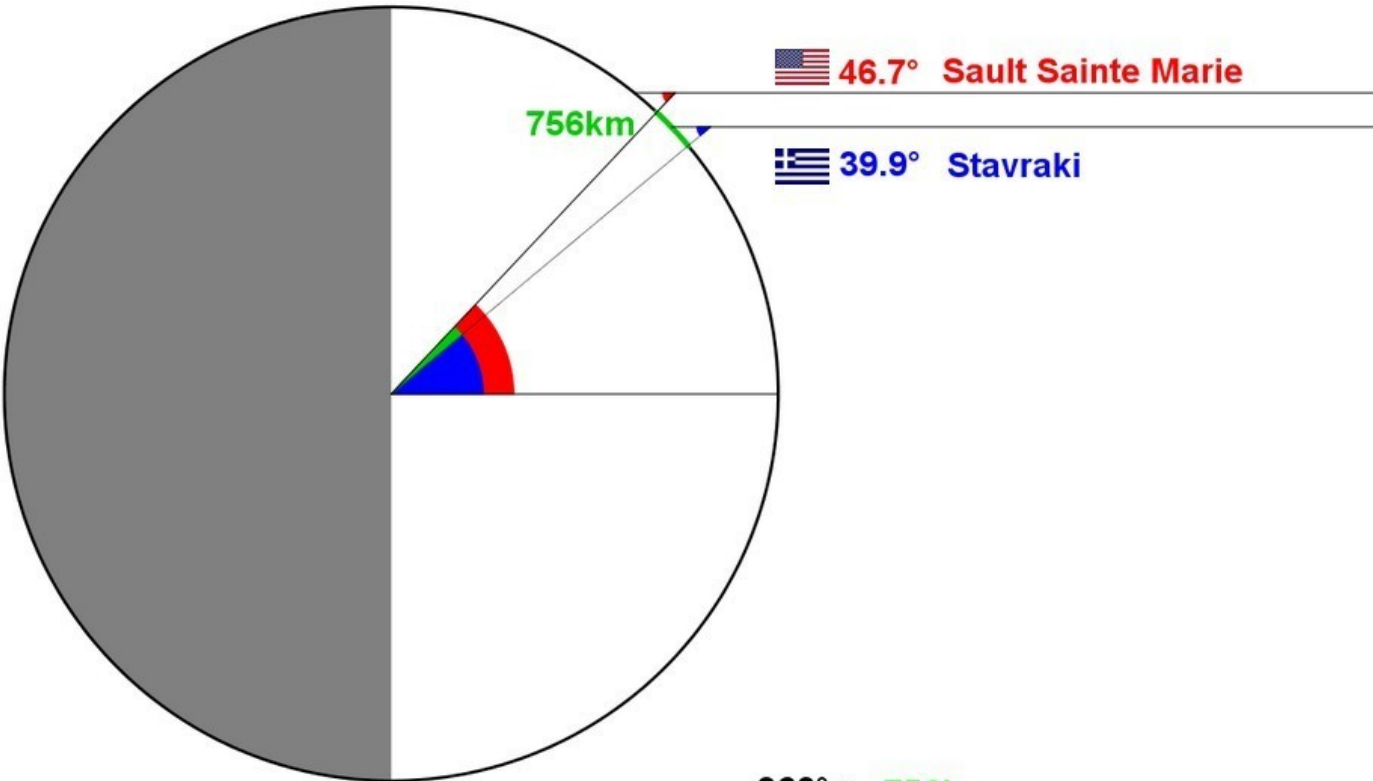
Sault Sainte Marie USA

Lake Superior State University
46.458 N 84.376 W

Date	Gnomon height [cm]	Shadow length [cm]	Angle (°)
20/03/2022	8.0	8.5	46.7

20/03/2022 (Sault Sainte Marie-USA) Latitude: 46.458°

20/03/2022 (Stavraki-Greece) Latitude: 39.654°



Distance	Angle
circumference	360°
756km	46.7° - 39.9°

circumference = $\frac{360^\circ \times 756\text{km}}{46.7^\circ - 39.9^\circ} = 40024\text{ km}$

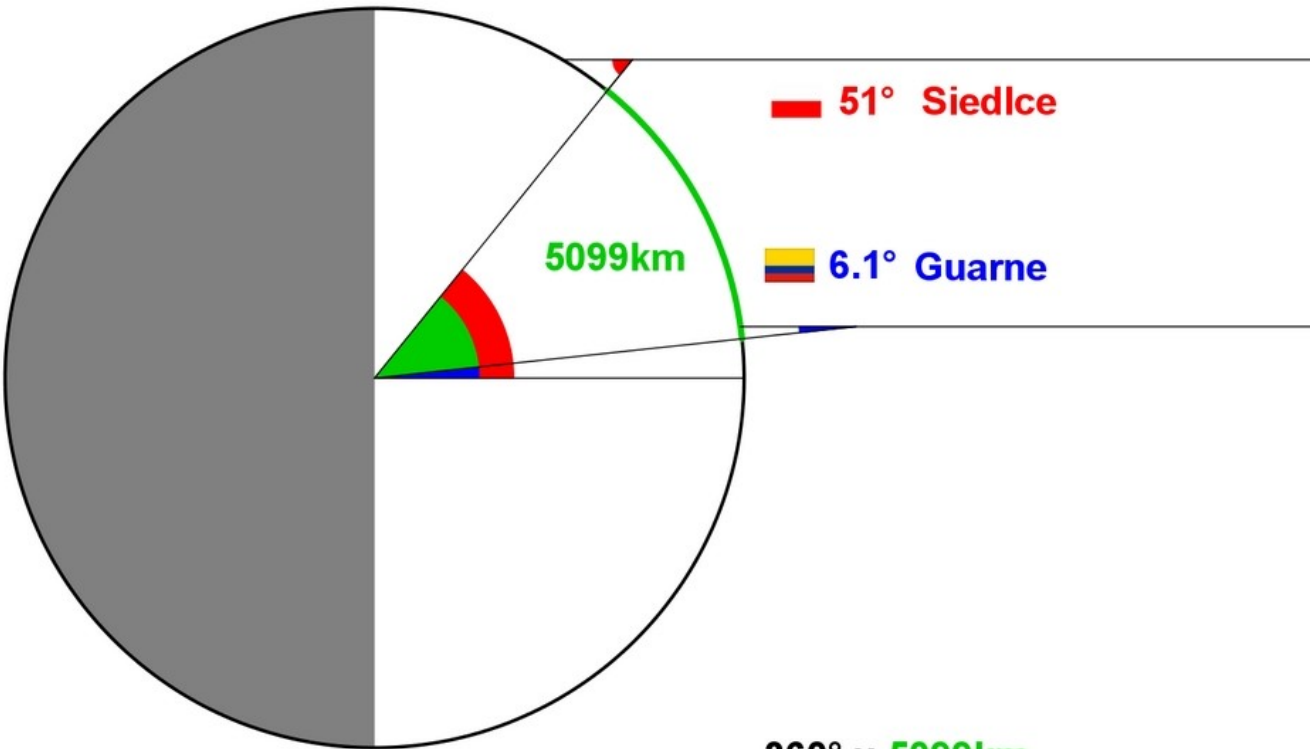


Siedlce Poland

1st Secondary School of Bolesław Prus
52.167 N 22.282 E

Date	Gnomon height [cm]	Shadow length [cm]	Angle (°)
21/03/2022	57.0	70.5	51.0

21/03/2022 (Siedlce-Poland) Latitude: 52.167°
21/03/2022 (Guarne-Colombia) Latitude: 6.274°



Distance	Angle
circumference	360°
5099km	51° - 6.1°

circumference = $\frac{360^\circ \times 5099\text{km}}{51^\circ - 6.1^\circ} = 40883 \text{ km}$



Slatina

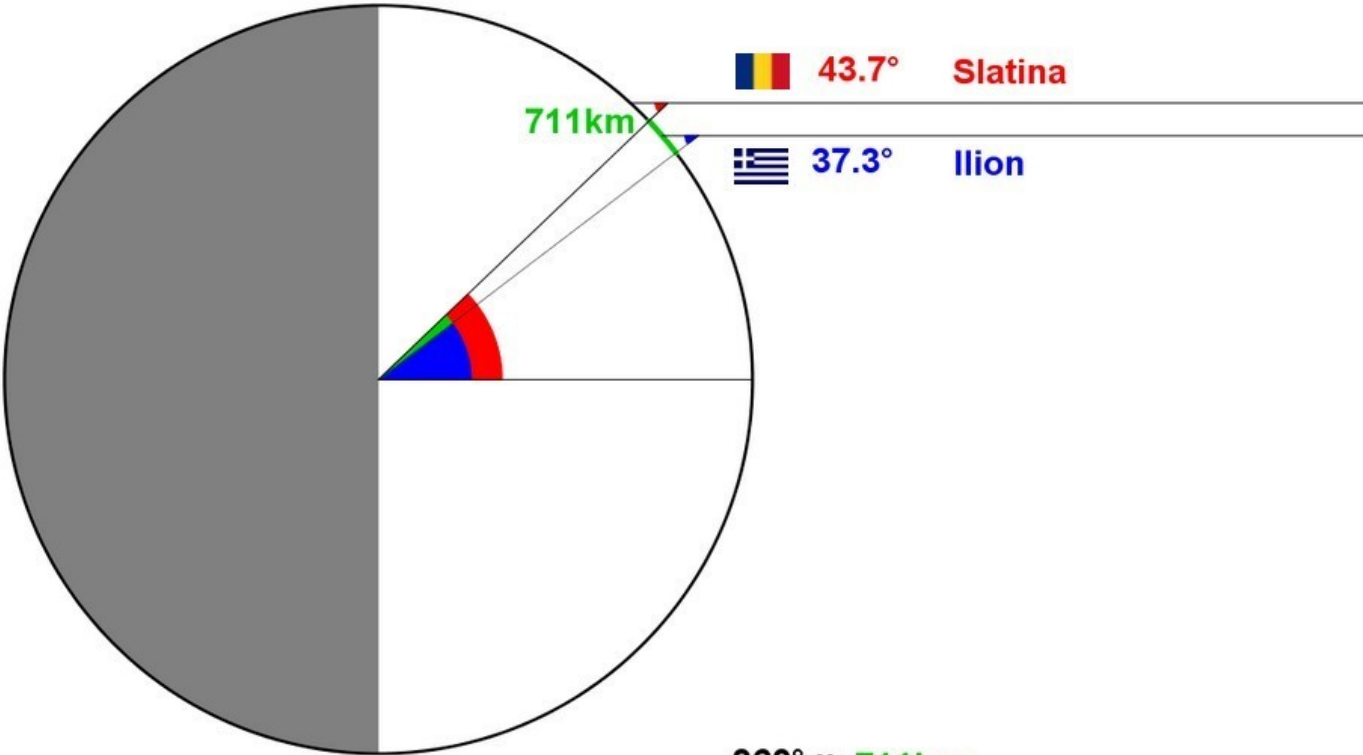
Romania

Secondary School Vlaicu Voda
44.432 N 24.377 E

Date	Gnomon height [cm]	Shadow length [cm]	Angle (°)
20/03/2023	100.0	97.3	44.2
21/03/2022	30.0	29.2	44.2
22/03/2022	100.0	95.5	43.7
23/03/2022	100.0	94.1	43.3

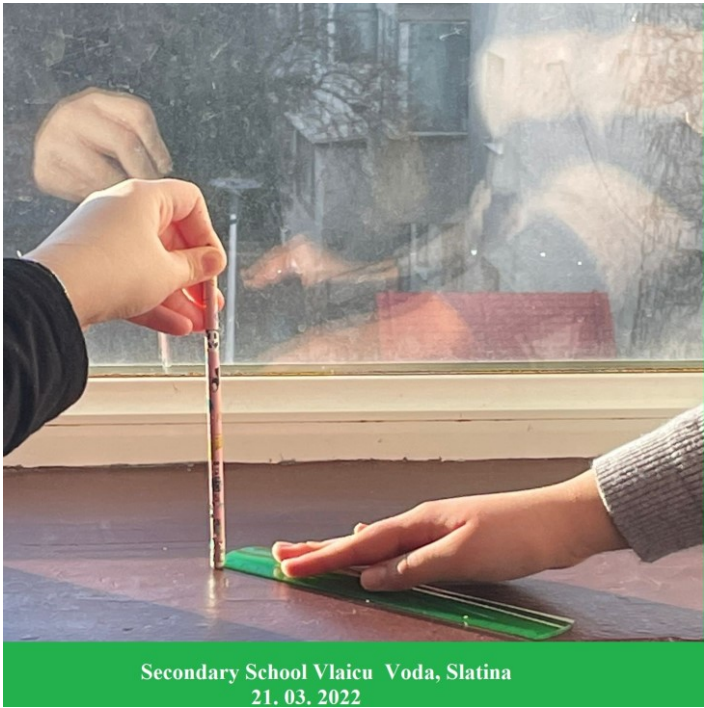
22/03/2022 (Slatina-Romania) Latitude: 44.432°

22/03/2022 (Ilion-Greece) Latitude: 38.033°



Distance	Angle
circumference	360°
711km	43.7° - 37.3°

circumference = $\frac{360^\circ \times 711\text{km}}{43.7^\circ - 37.3^\circ} = 39994 \text{ km}$



Secondary School Vlaicu Voda, Slatina
21. 03. 2022

Stavraki

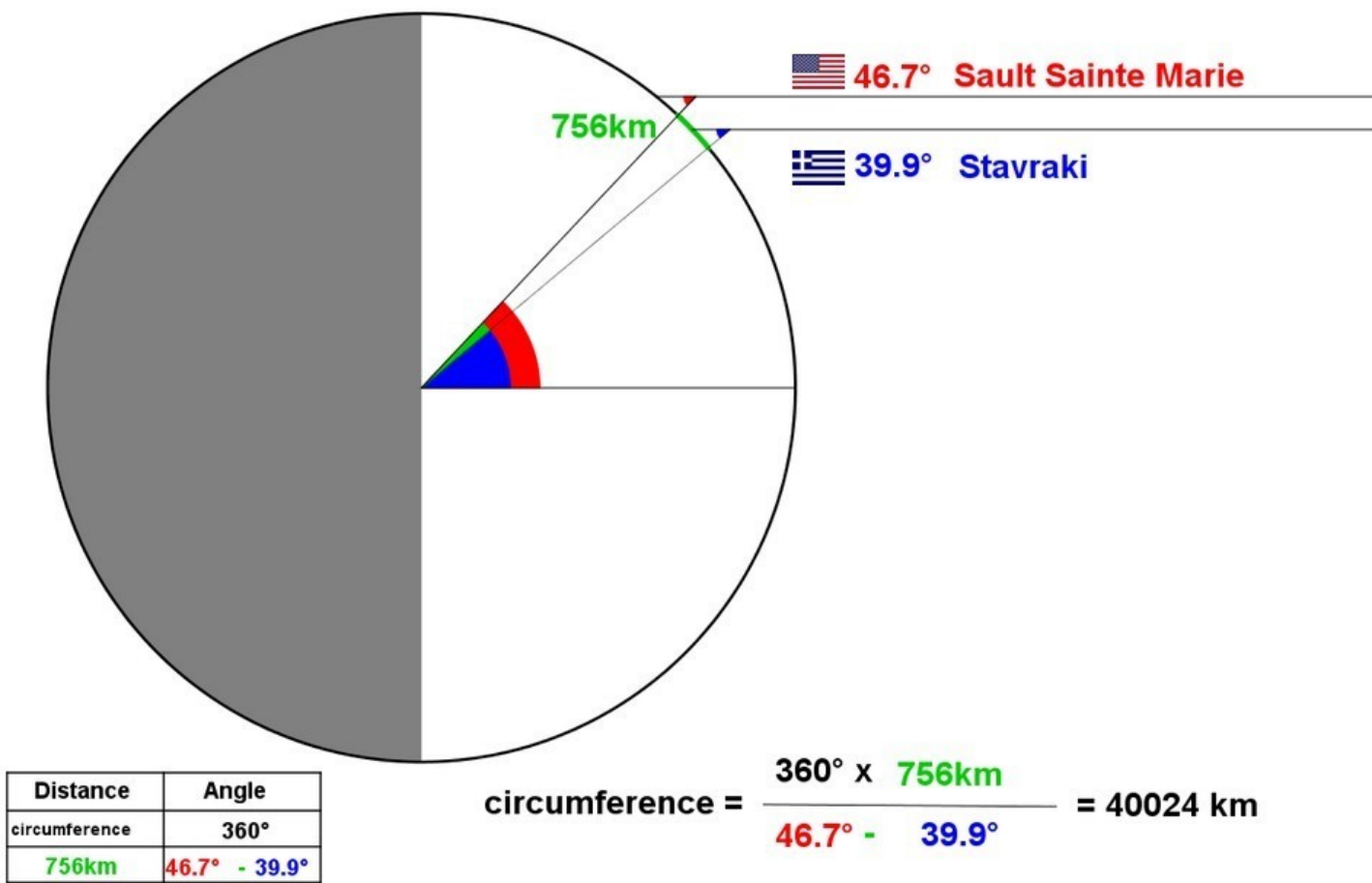
Greece

Primary School of Stavraki
39.654 N 20.817 E

Date	Gnomon height [cm]	Shadow length [cm]	Angle (°)
17/03/2022	27.0	23.0	40.4
20/03/2022	100.0	83.5	39.9
21/03/2022	100.0	82.0	39.4

20/03/2022 (Sault Sainte Marie-USA) Latitude: 46.458°

20/03/2022 (Stavraki-Greece) Latitude: 39.654°



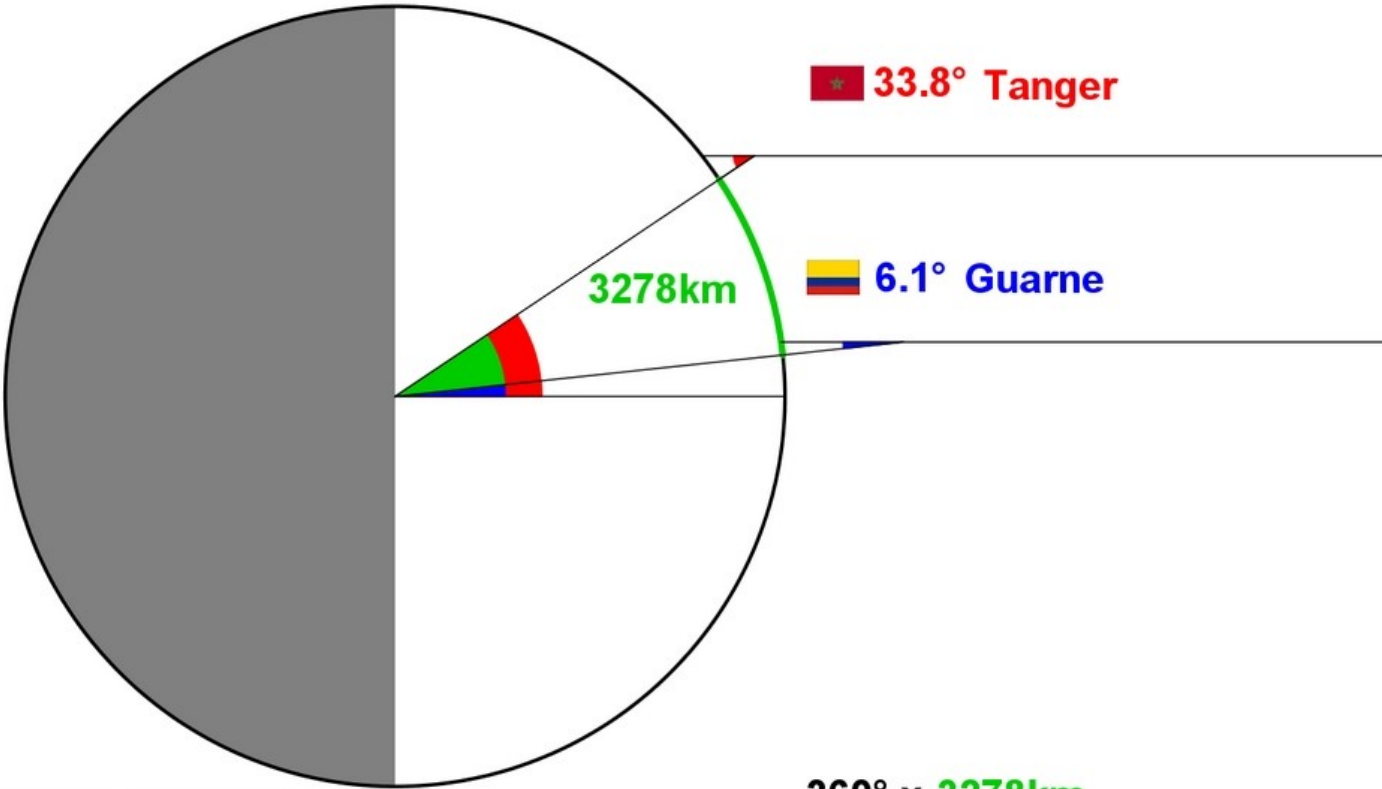
Tanger Morocco

Groupe scolaire Annour
35.783 N 5.827 W

Date	Gnomon height [cm]	Shadow length [cm]	Angle (°)
21/03/2022	122.5	82.0	33.8

21/03/2022 (Tanger-Morocco) Latitude: 35.783°

21/03/2022 (Guarne-Colombia) Latitude: 6.274°



Distance	Angle
circumference	360°
3278km	33.8° - 6.1°

circumference = $\frac{360^\circ \times 3278\text{km}}{33.8^\circ - 6.1^\circ} = 42602 \text{ km}$





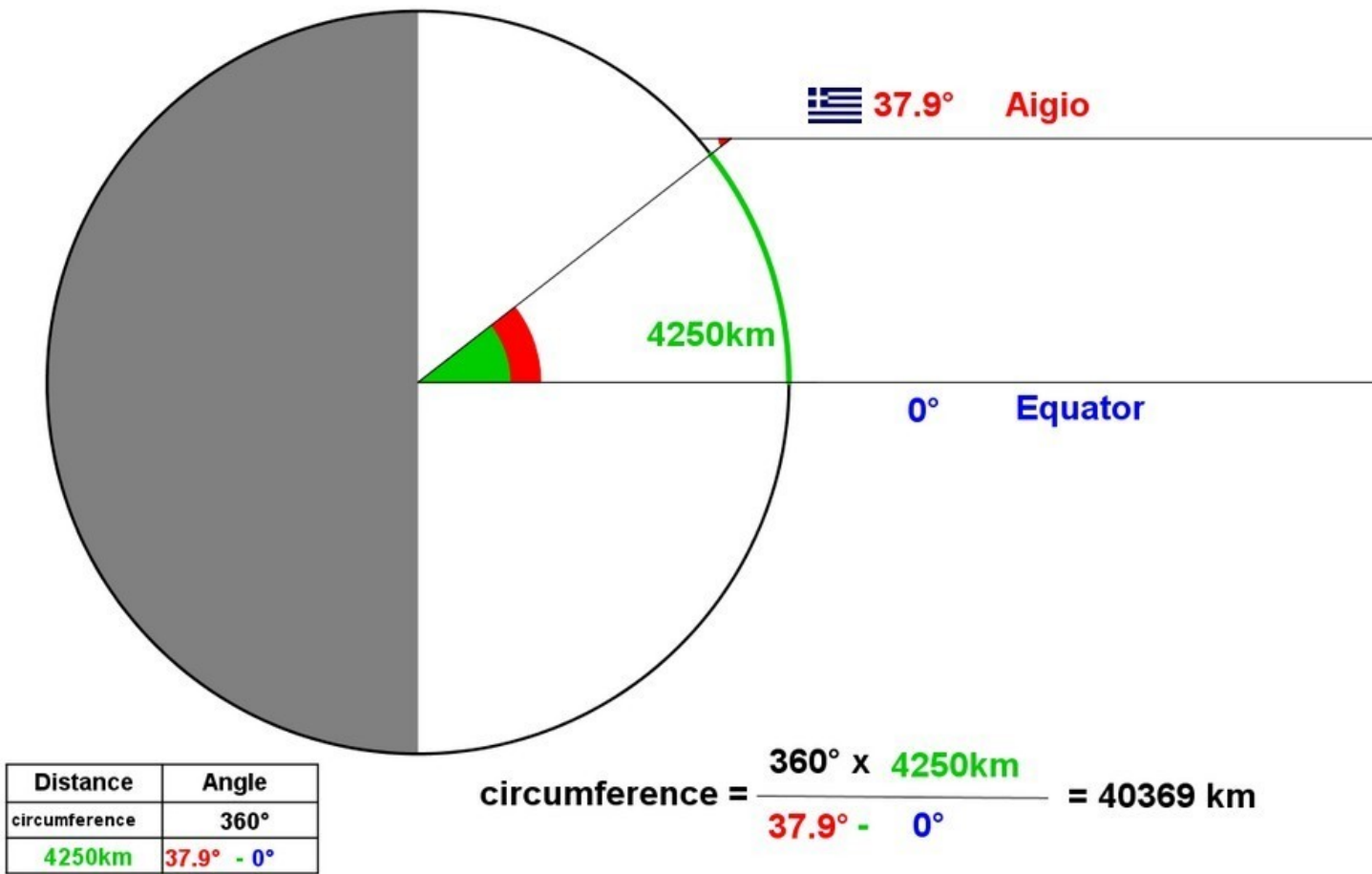
The Eratosthenes method

Table of measurements.

20 March 2021	Latitude	Angle of the sun (°)	Distance to equator (km)	Circumference (km)
Sault Sainte Marie	46.458	46.7	5161	39785
Pogana	46.313	46.4	5145	39918
Barlad	46.234	46.3	5137	39942
Busteni	45.416	45.5	5046	39924
Slatina	44.432	44.2	4936	40203
Montcuq	44.340	44.3	4926	40031
Stavraki	39.654	39.9	4406	39753
Benidorm	38.541	38.3	4282	40249
Aigio	38.252	37.9	4250	40369
Ilion	38.033	37.9	4225	40132
Bayamón	18.383	18.4	2042	39952
Hô Chi Minh City	10.759	10.7	1195	40206
Medellin	6.200	6.1	689	40662
Chivilcoy	-34.911	-34.9	-3879	40013
equator	0.000	0.0	0	

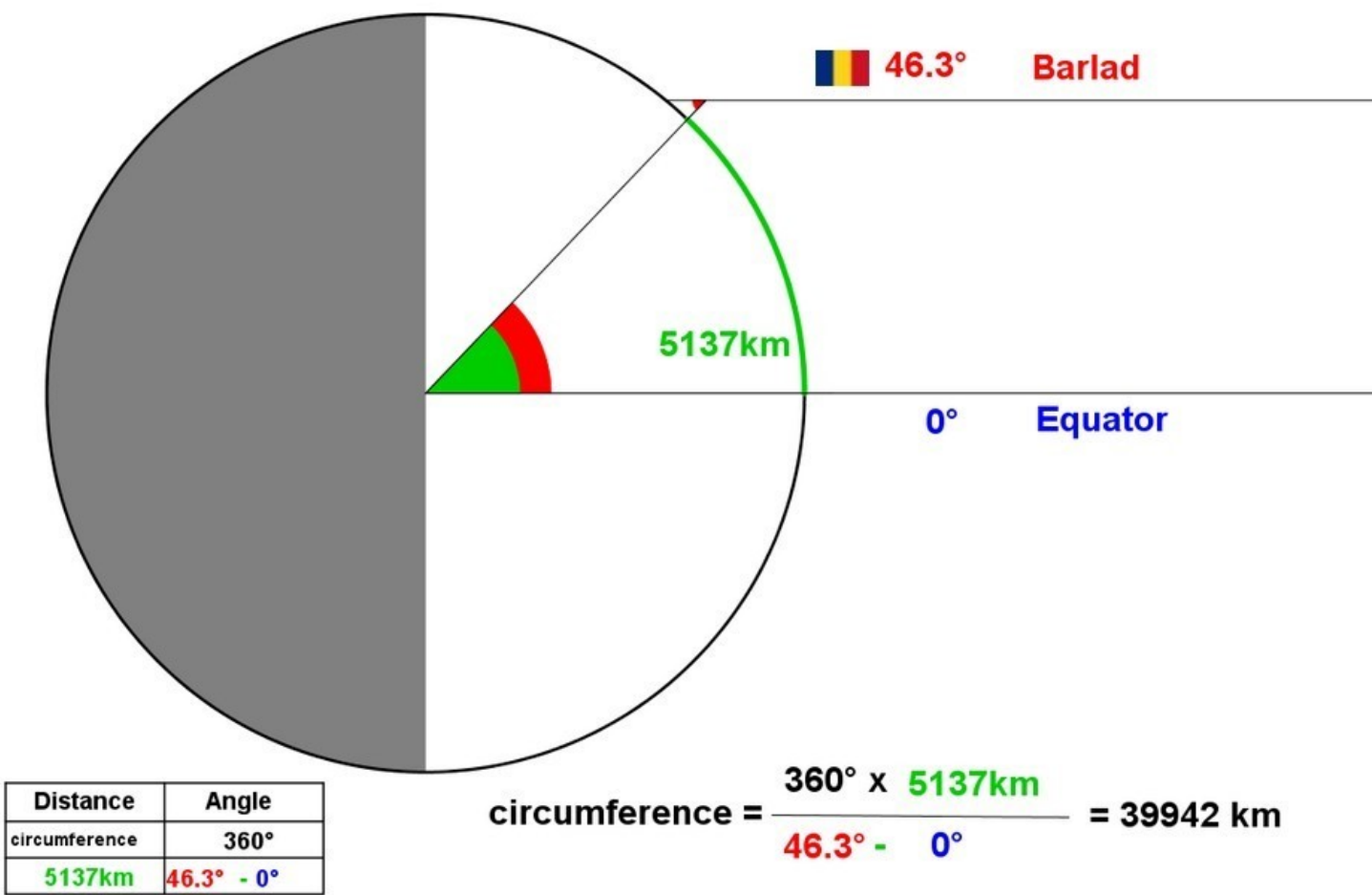
20/03/2022 (Aigio-Greece) Latitude: 38.252°

20/03/2022 (Equator-.) Latitude: 0°



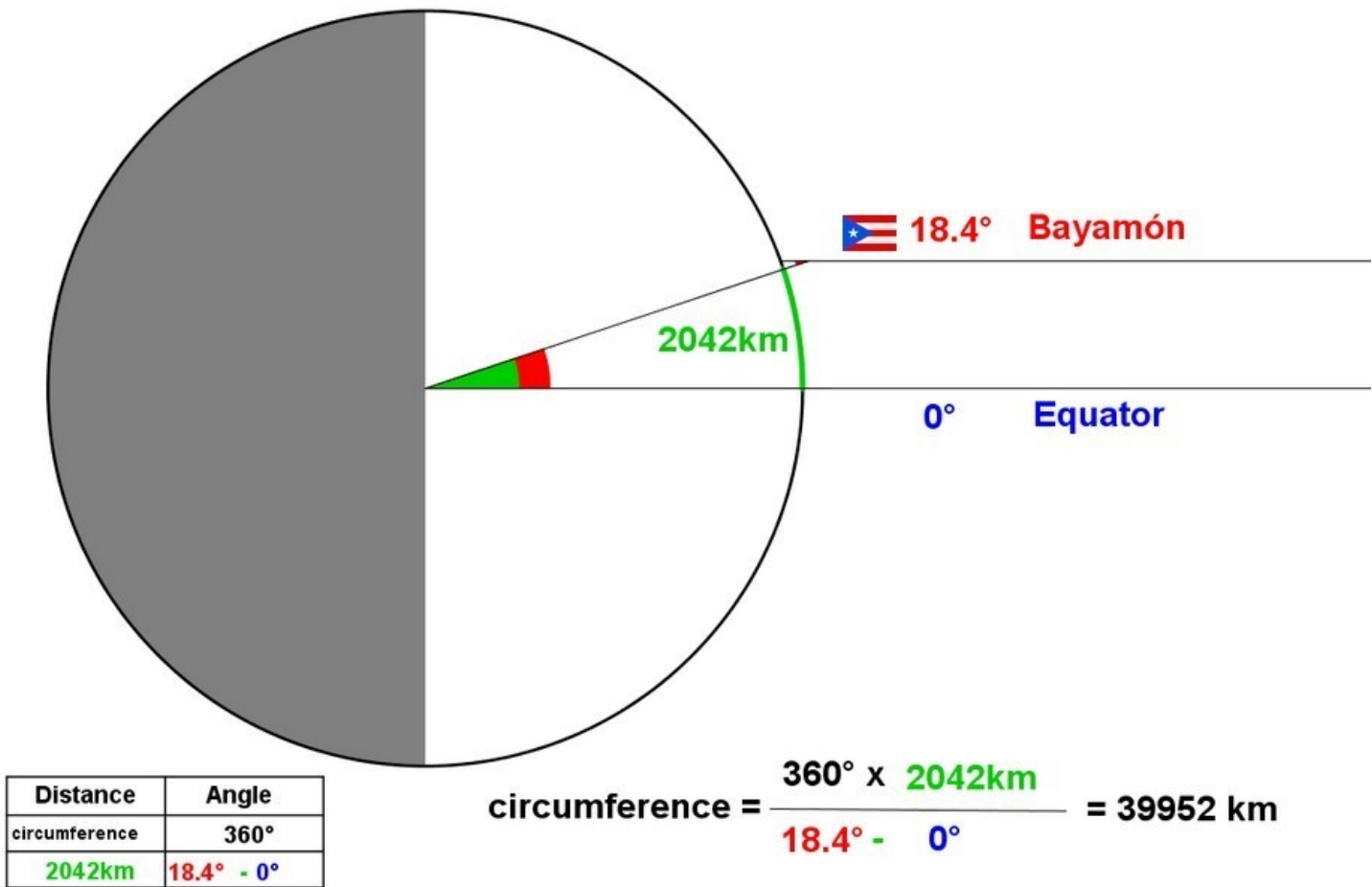
20/03/2023 (Barlad-Romania) Latitude: 46.234°

20/03/2022 (Equator-.) Latitude: 0°



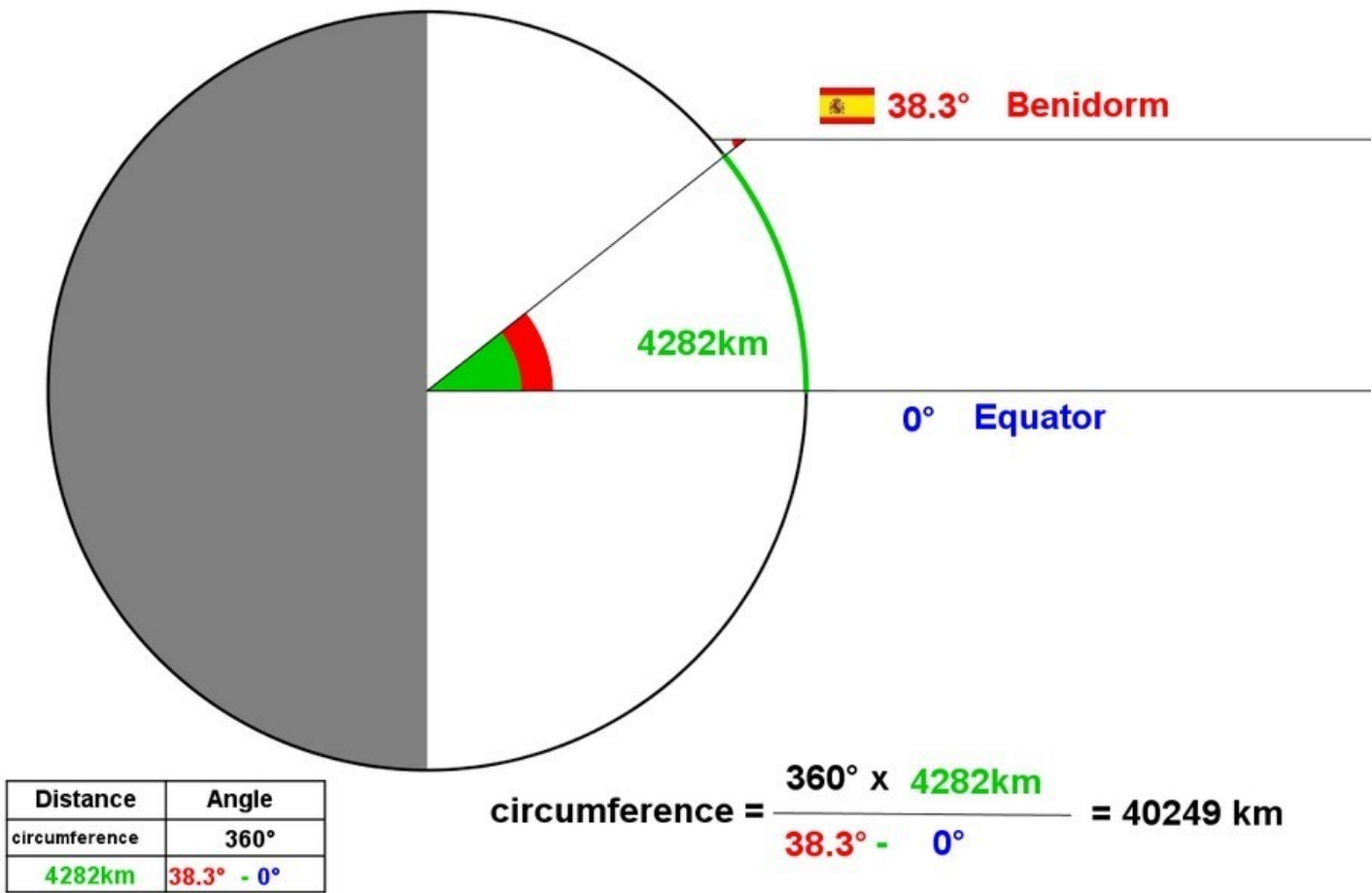
20/03/2022 (Bayamón-Puerto Rico) Latitude: 18.383°

20/03/2022 (Equator-.) Latitude: 0°



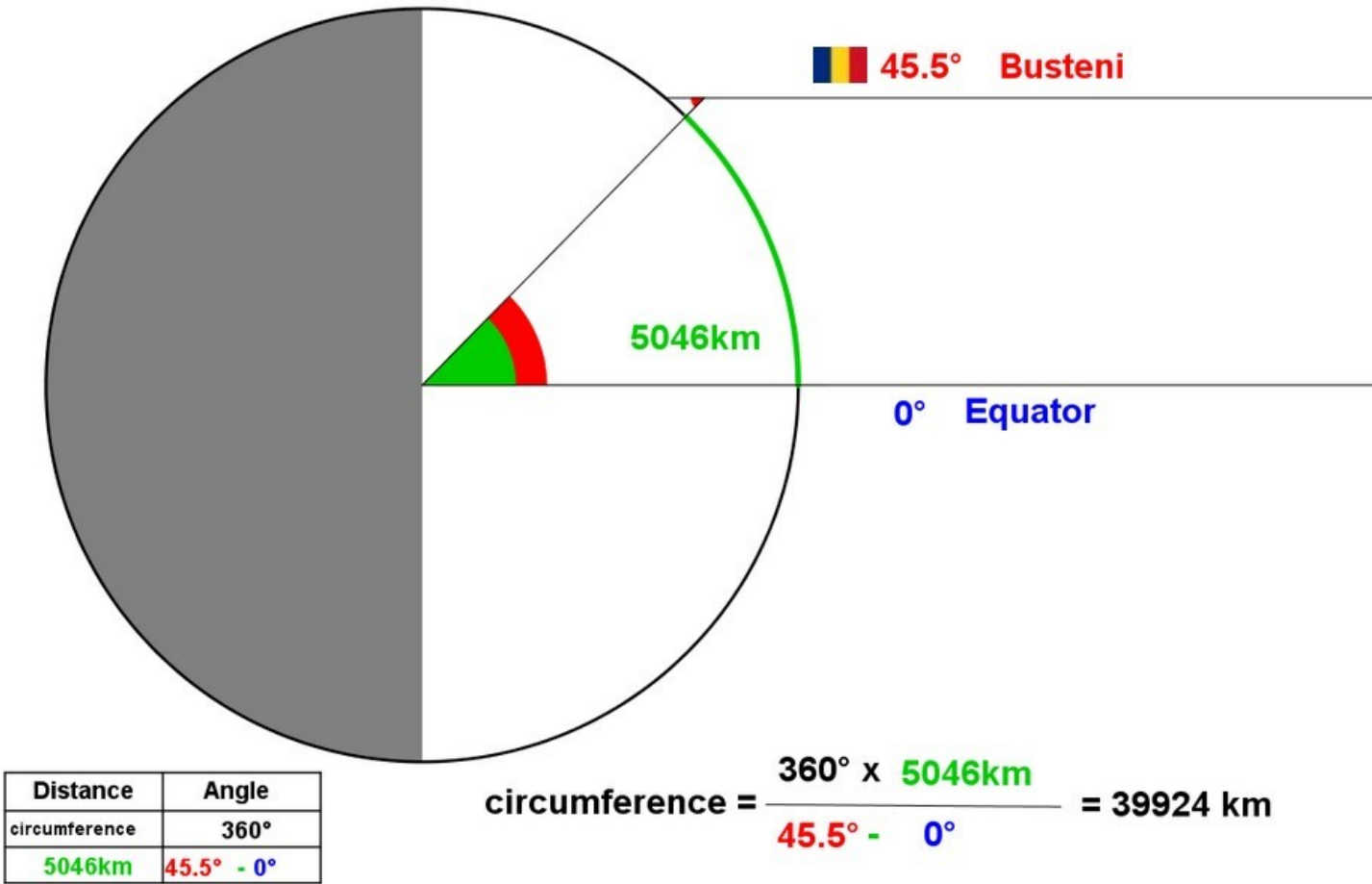
20/03/2022 (Benidorm-Spain) Latitude: 38.541°

20/03/2022 (Equator-.) Latitude: 0°



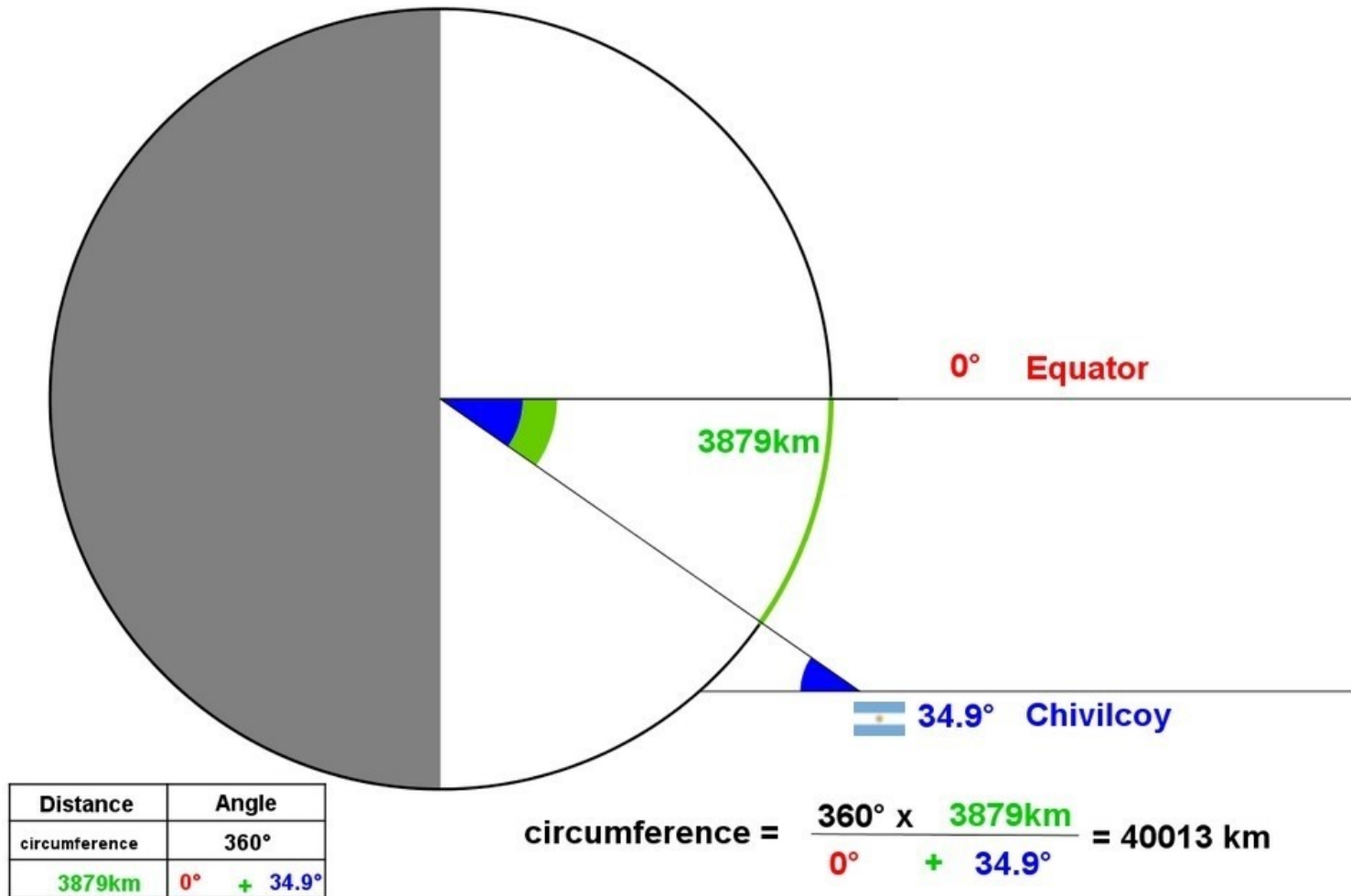
20/03/2022 (Busteni-Romania) Latitude: 45.416°

20/03/2022 (Equator-) Latitude: 0°



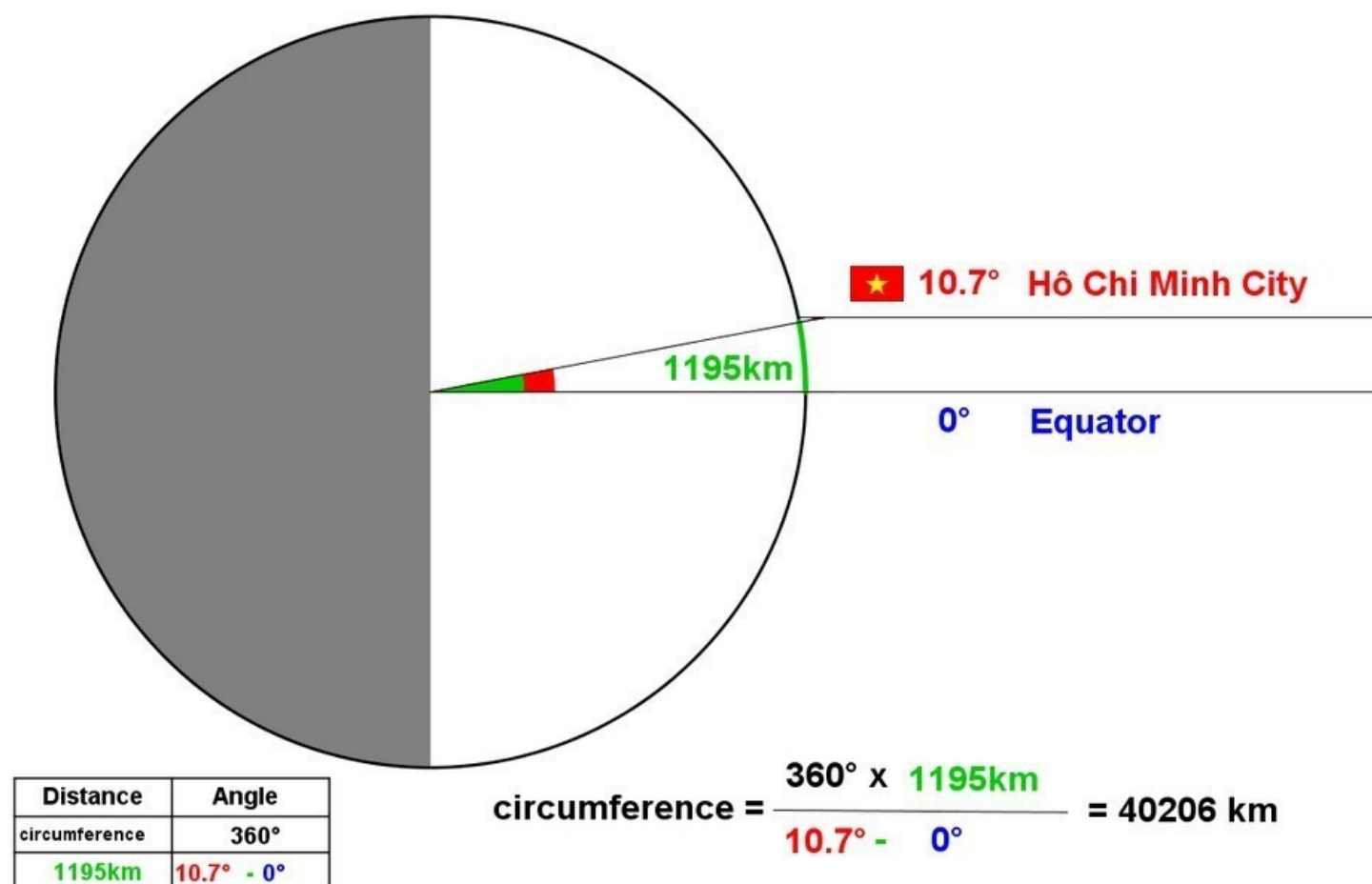
20/03/2022 (Equator-) Latitude: 0°

20/03/2022 (Chivilcoy-Argentina) Latitude: -34.911°



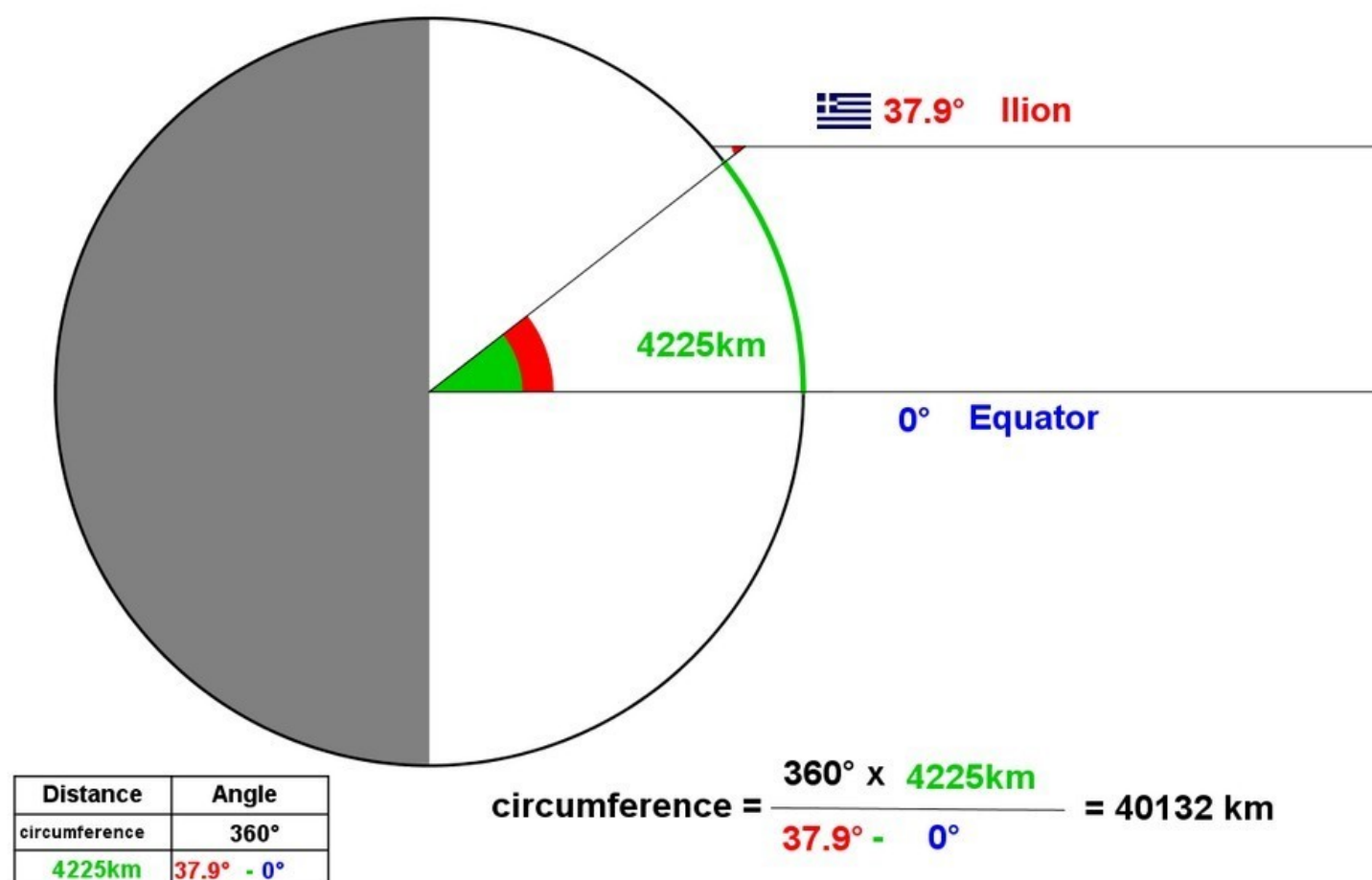
20/03/2022 (Hô Chi Minh City-Vietnam) Latitude: 10.759°

20/03/2022 (Equator-.) Latitude: 0°



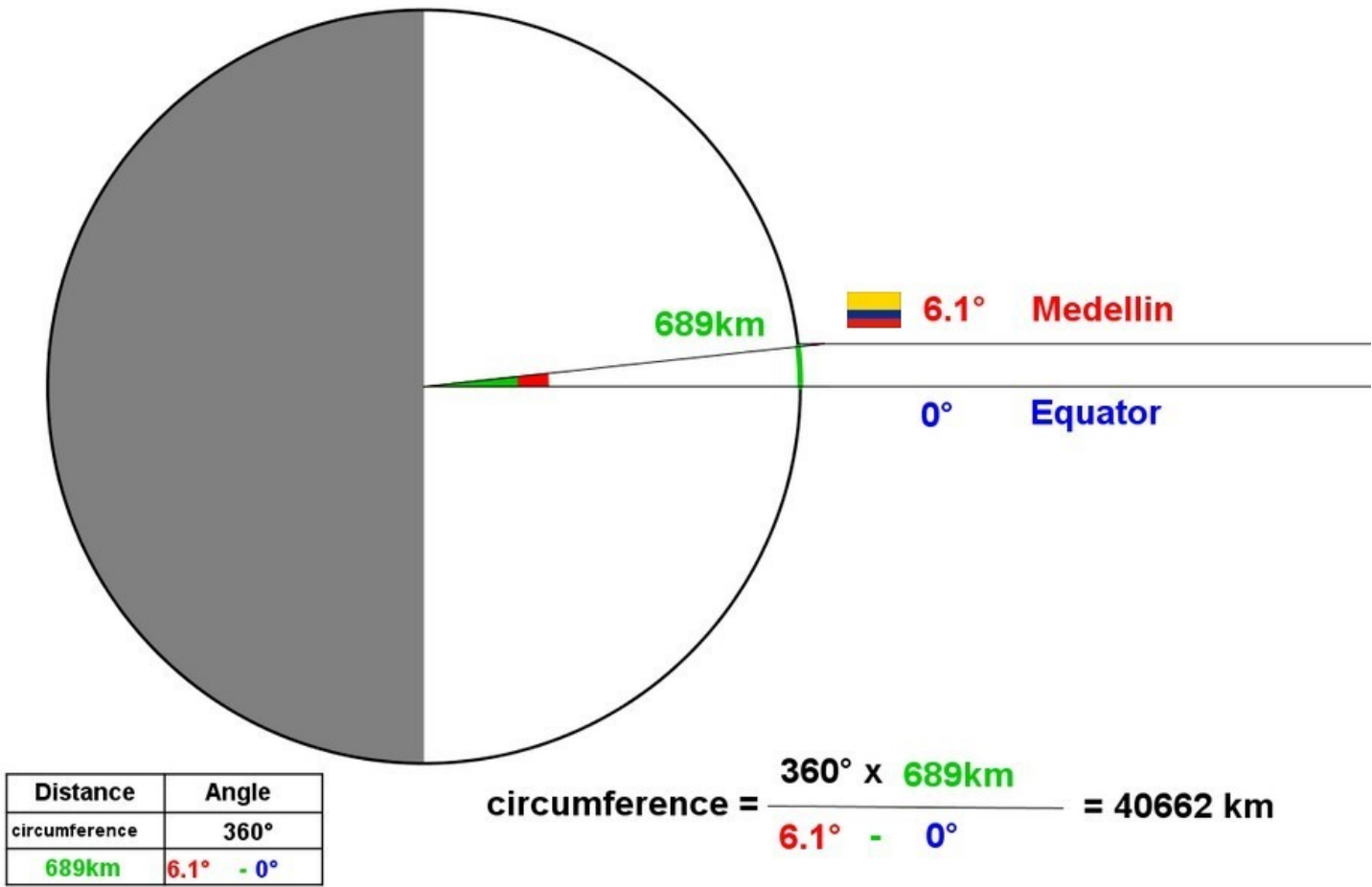
20/03/2022 (Ilion-Greece) Latitude: 38.033°

20/03/2022 (Equator-.) Latitude: 0°



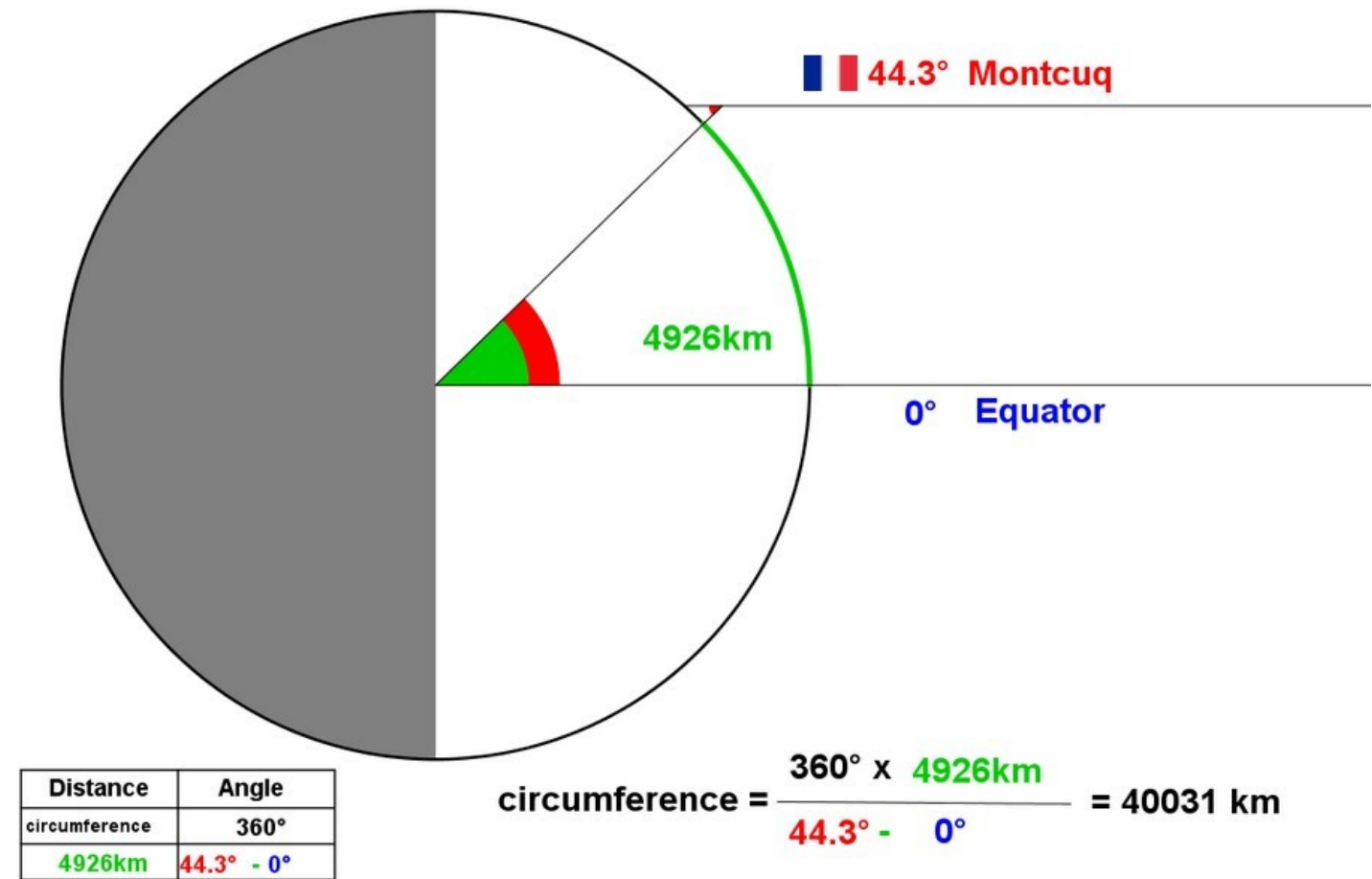
20/03/2022 (Medellin-Colombia) Latitude: 6.2°

20/03/2022 (Equator-.) Latitude: 0°



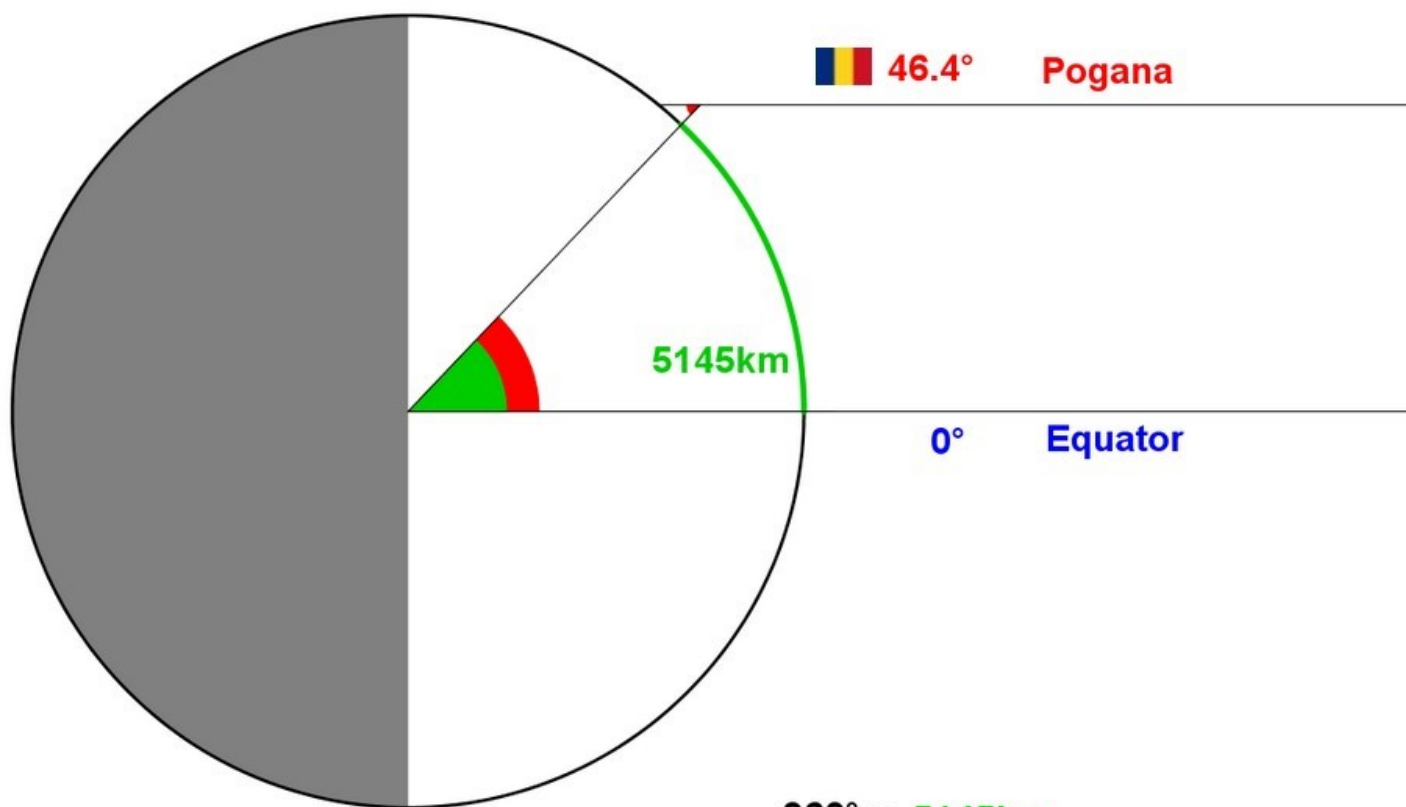
20/03/2022 (Montcuq-France) Latitude: 44.34°

20/03/2022 (Equator-.) Latitude: 0°



20/03/2022 (Pogana-Romania) Latitude: 46.313°

20/03/2022 (Equator-.) Latitude: 0°

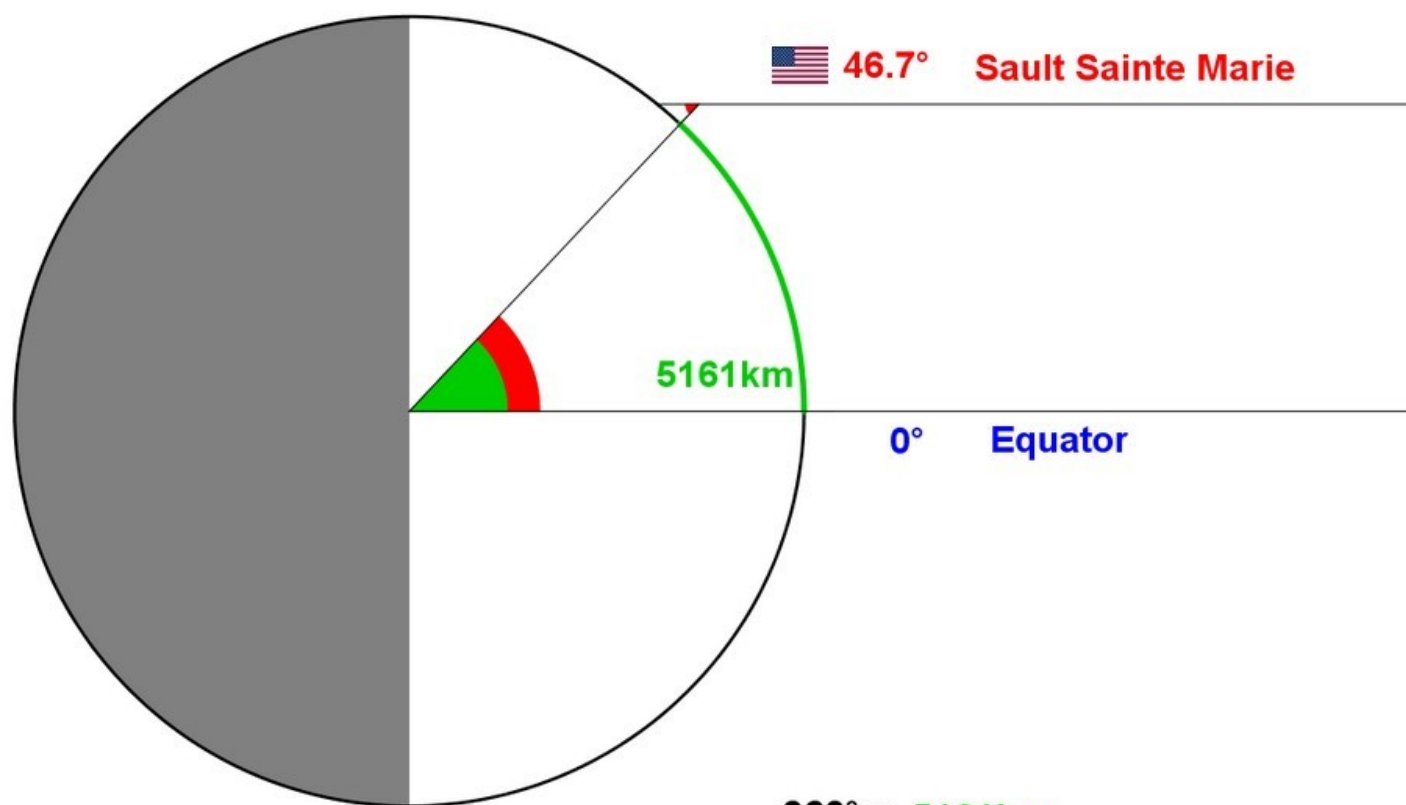


Distance	Angle
circumference	360°
5145km	46.4° - 0°

$$\text{circumference} = \frac{360^\circ \times 5145\text{km}}{46.4^\circ - 0^\circ} = 39918 \text{ km}$$

20/03/2022 (Sault Sainte Marie-USA) Latitude: 46.458°

20/03/2022 (Equator-.) Latitude: 0°

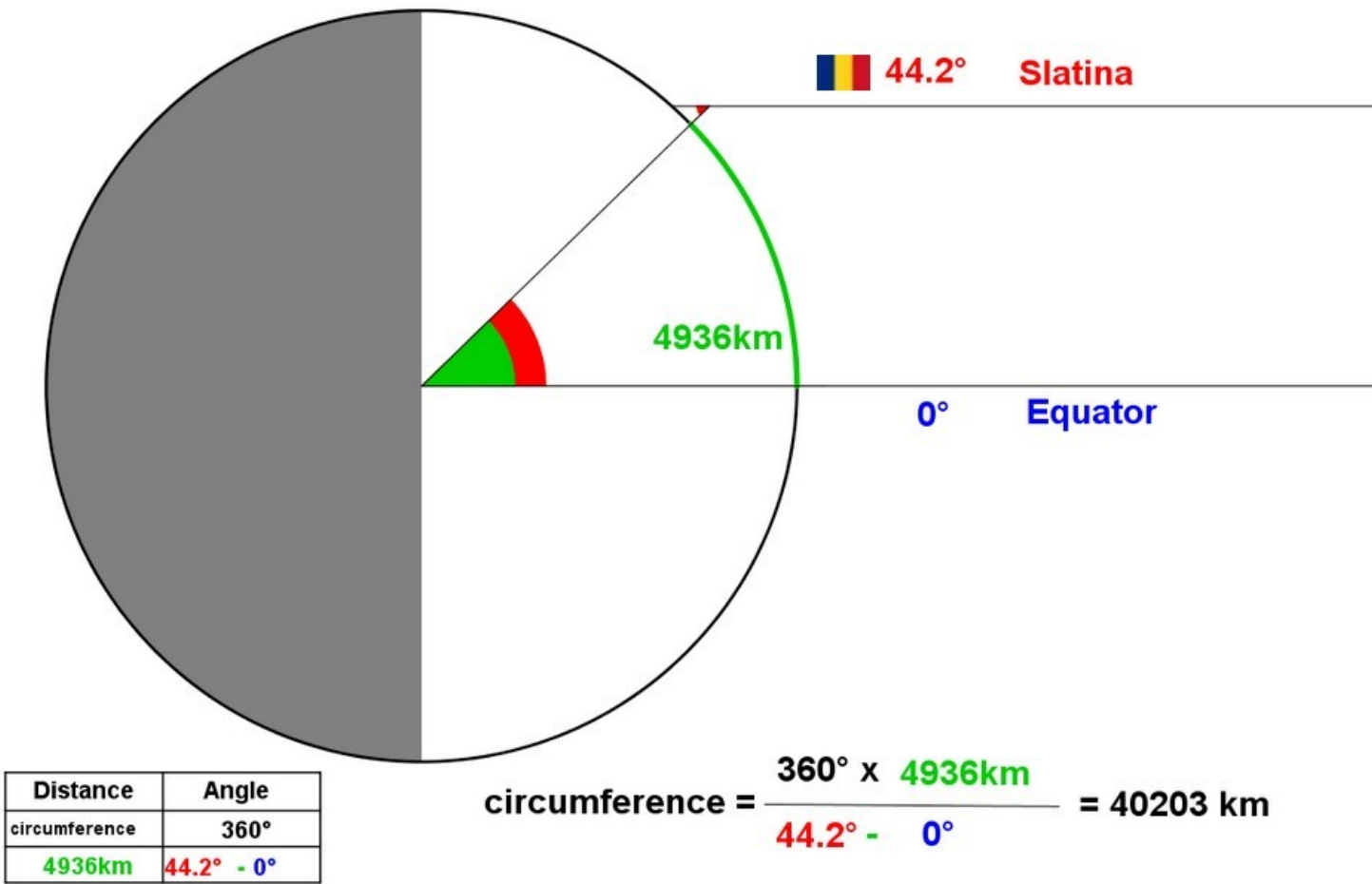


Distance	Angle
circumference	360°
5161km	46.7° - 0°

$$\text{circumference} = \frac{360^\circ \times 5161\text{km}}{46.7^\circ - 0^\circ} = 39785 \text{ km}$$

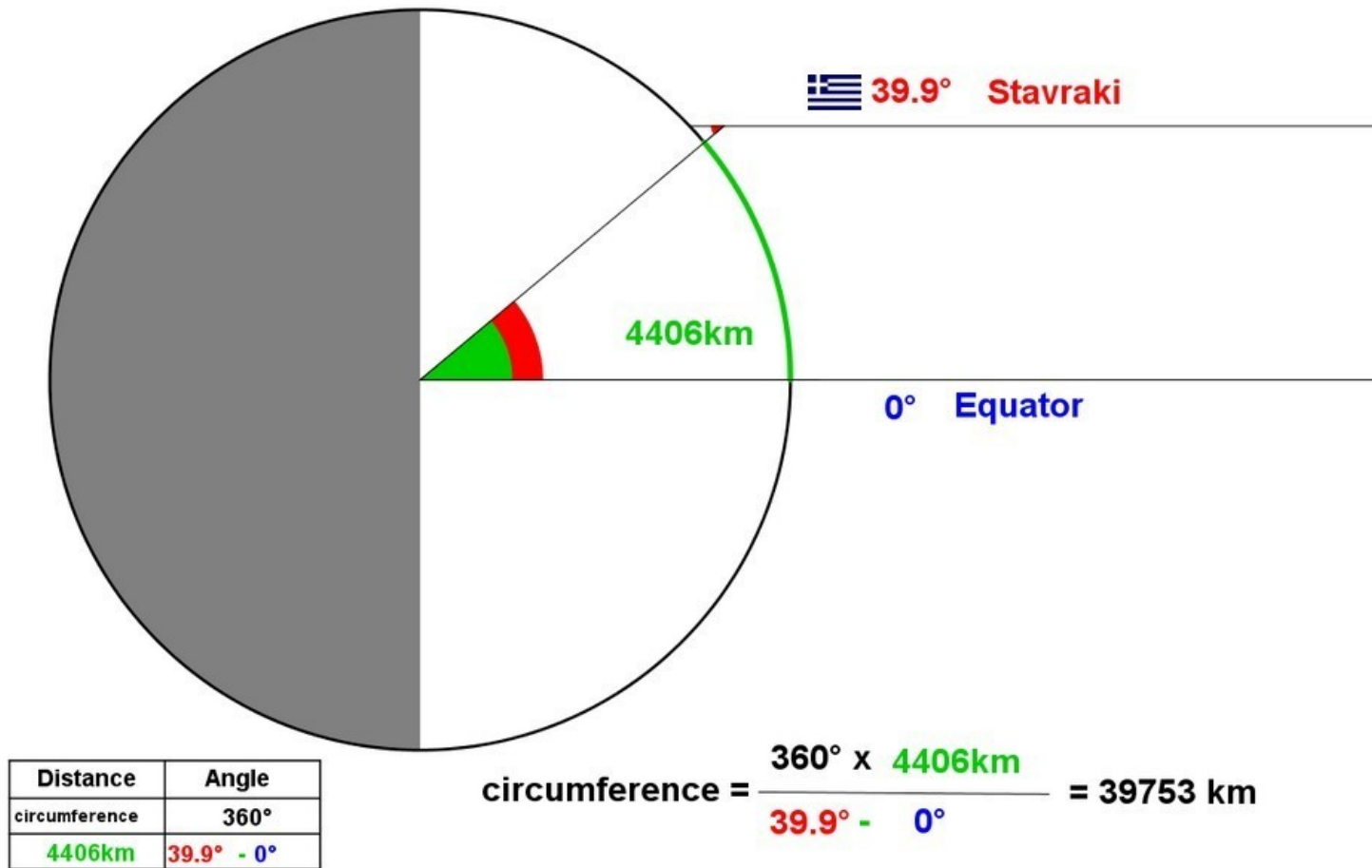
20/03/2023 (Slatina-Romania) Latitude: 44.432°

20/03/2022 (Equator-.) Latitude: 0°



20/03/2022 (Stavraki-Greece) Latitude: 39.654°

20/03/2022 (Equator-.) Latitude: 0°





Angle of the Sun and latitude

20 schools realized 46 measures of the angle of the sun from 17 to 23 March at solar noon.

This angle decreases by 0.4° per day and is equal to the latitude on the day of the equinox (taking into account the measurement errors)

City	Country	Latitude (+N/-S)	Angle (°) 17/03	Angle (°) 18/03	Angle (°) 19/03	Angle (°) 20/03	Angle (°) 21/03	Angle (°) 22/03	Angle (°) 23/03
Aigio	Greece	38.252				37.9	37.5	37.6	
Athens	Greece	38.027					37.4		
Barlád	Romania	46.234				46.3			
Bayamón	Puerto Rico	18.383	18.8			18.4			
Benidorm	Spain	38.541				38.3			
Busteni	Romania	45.416		46.3	45.9	45.5	45.1		44.3
Chivilcoy	Argentina	-34.911	-33.7	-34.1	-34.4	-34.9			
Guarne	Colombia	6.274	7.1				6.1		
Hồ Chí Minh City	Vietnam	10.759				10.7			
Hoàng Giang	Vietnam	19.886						18.2	
Ilion	Greece	38.033				37.9		37.3	
Malovat	Romania	44.707		45.6			44.4		
Medellín	Colombia	6.2				6.1			
Montcuq	France	44.340	45.5	45.2	44.8	44.3	44.1	43.6	43.3
Pogana	Romania	46.313	47.5	47.2		46.4			
Sault Sainte Marie	USA	46.458				46.7			
Siedlce	Poland	52.167					51		
Slatina	Romania	44.432				44.2	44.2	43.7	43.3
Stavraki	Greece	39.654	40.4			39.9	39.4		
Tanger	Morocco	35.783					33.8		

