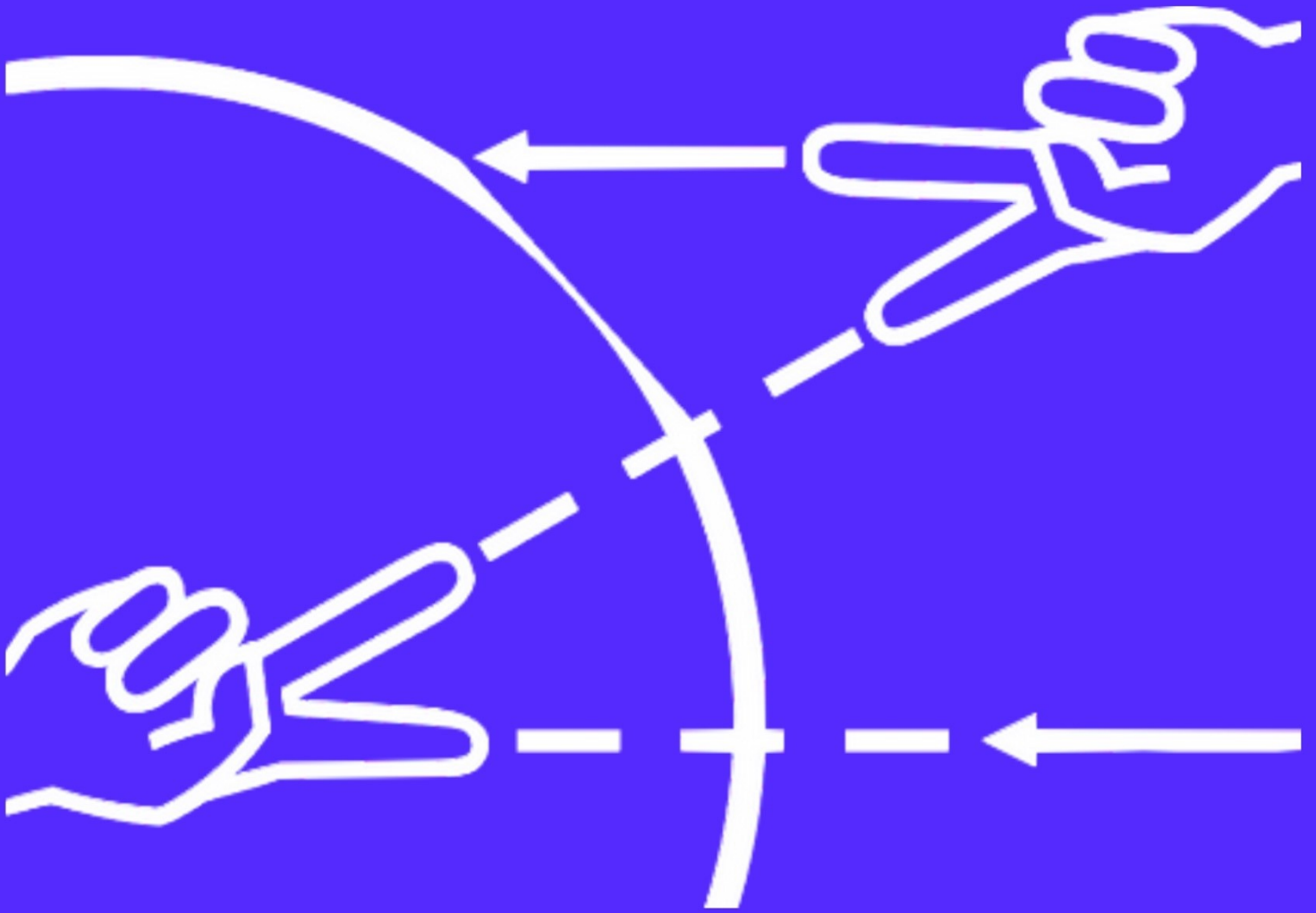


Eratosthenes



3 Continents

10 Countries

19 Schools

75 Measures

N°46

October 2019

3 Continents

10 Countries

19 Schools

75 Measures

ARGENTINA (2)

Buenos Aires N°1, Chivilcoy

BRAZIL (3)

Itajubá, Piranguinho, Rio de Janeiro

COLOMBIA (2)

Guarne, Frontino

FRANCE (1)

Lafrançaise

GREECE (4)

Aigio, Athens, Ilion, Ioannina, Petropouli

INDIA (2)

Yamunanagar (2)

PAKISTAN (1)

Jajjah Abbasian

ROMANIA (2)

Busteni, Mărgineni

SPAIN (1)

Úbeda


VIETNAM (1)

Hồ Chí Minh City

Flag	City	Country	School	Latitude (°) +N/-S	Longitude (°) +E/-W
	Aigio	Greece	1st High School of Aigio	38.252	22.079
	Athens	Greece	Experimental College Agion Anargyron	38.027	23.726
	Buenos Aires ENS1	Argentina	ENS N° 1	-34.455	-58.544
	Busteni	Romania	Colegiul Ion Kalinderu	45.416	25.535
	Chivilcoy	Argentina	Parque Cielos del Sur	-34.911	-60.014
	Frontino	Colombia	Astronomy Club Astrofron	6.777	-76.132
	Guarne	Colombia	Grupo Astrofanáticos	6.274	-75.449
	Hồ Chí Minh City NT	Việt Nam	Nguyen Trai High School	10.760	106.712
	Ilion	Greece	11th JuniorHigh School of Ilion	38.033	23.697
	Itajubá	Brazil	Universidade Federal de Itajubá	-22.415	-45.449
	Jajjah Abbasian	Pakistan	Government Boys Secondary School	28.754	70.569
	Lafrançaise	France	Collège Antonin Perbosc	44.127	1.237
	Mărgineni	Romania	Gh. Popescu School	44.533	24.554
	Petroupoli	Greece	4o Junior High School	38.036	23.674
	Piranguinho	Brazil	Universidade Federal de Itajubá	-22.411	-45.535
	Rio de Janeiro	Brazil	Centro Educacional Nosso Mundo	-22.890	-43.317
	Úbeda	Spain	Colegio Salesiano Santo Domingo Savio	38.017	-3.367
	Yamunanagar	India	GSSS Camp Jain Colony	30.121	77.263
	Yamunanagar SD	India	Spring Dales Public School	30.133	77.250

Aigio, Greece

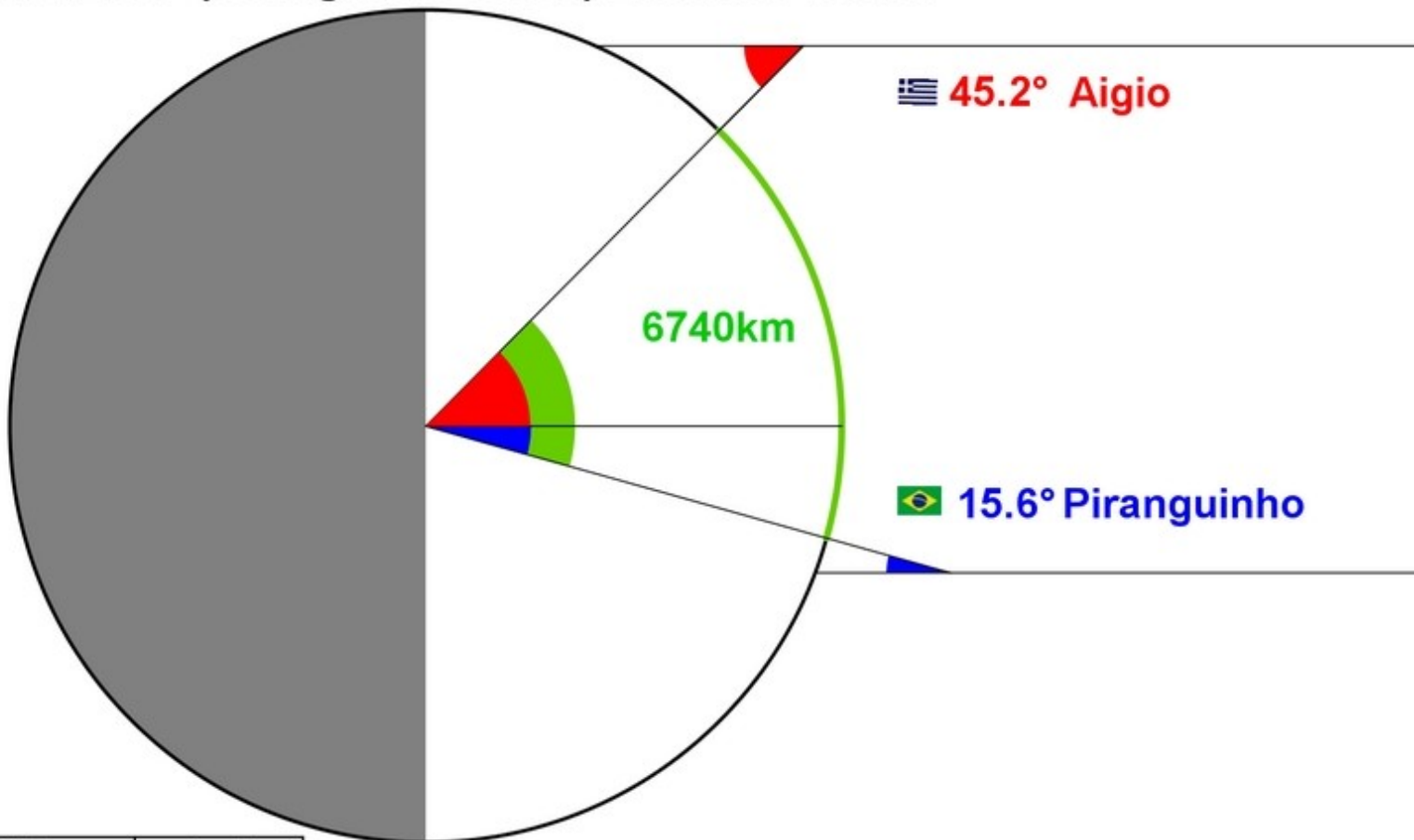


Flag	City	Country	School	Latitude (°) +N/-S	Longitude (°) +E/-W
	Aigio	Greece	1st High School of Aigio	38.252	22.079

Date	Gnomon	Shadow	Angle
11 October 2019	30.0cm	30.2cm	45.2°
14 October 2019	30.0cm	31.2cm	46.1°
18 October 2019	30.0cm	33.0cm	47.7°

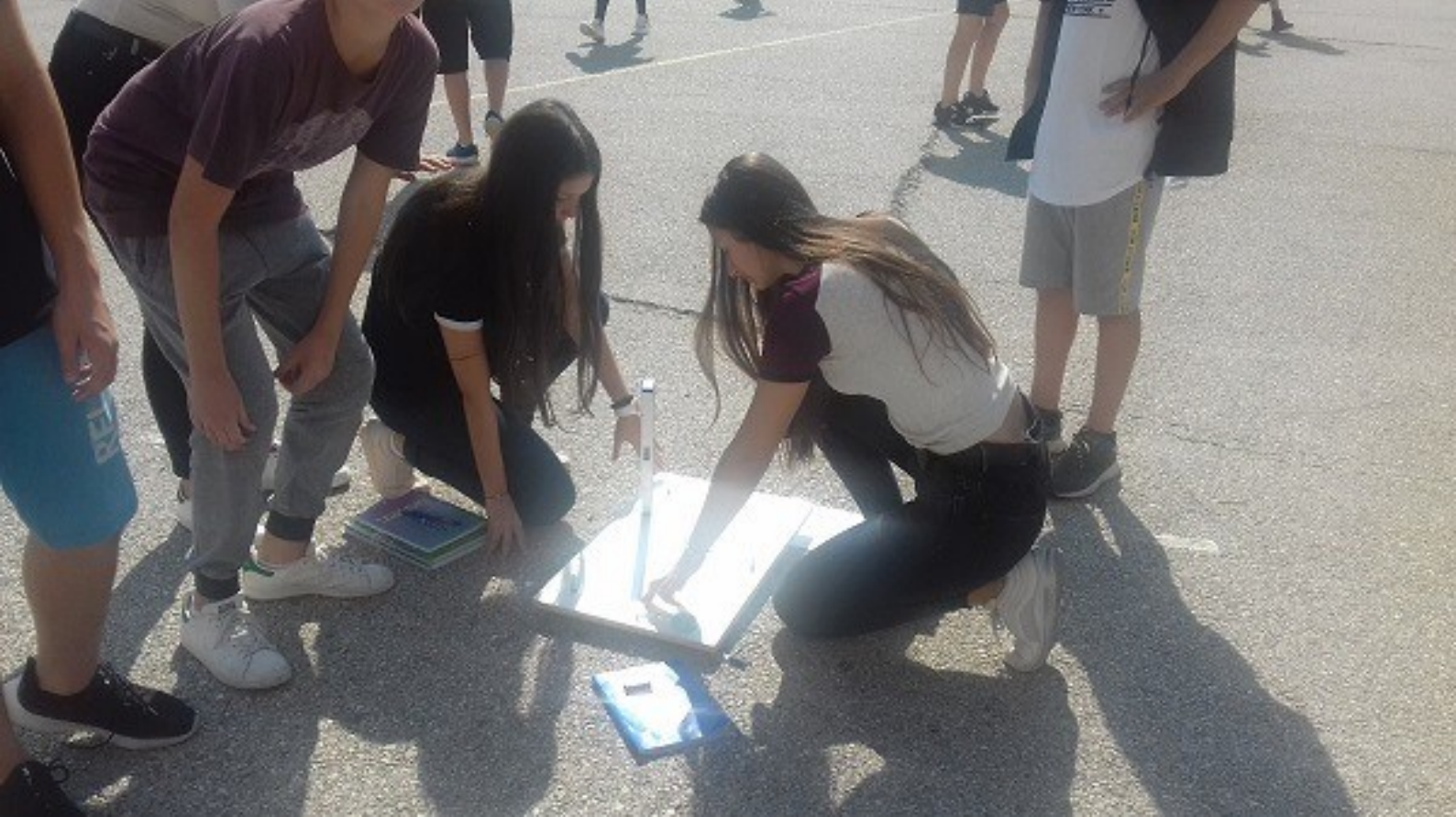
11/10/2019 (Aigio-Greece) Latitude: 38.252°

11/10/2019 (Piranguinho-Brazil) Latitude: -22.411°



Distance	Angle
circumference	360°
6740km	45.2° + 15.6°

$$\text{circumference} = \frac{360^\circ \times 6740\text{km}}{45.2^\circ + 15.6^\circ} = 39908 \text{ km}$$



Athens, Greece

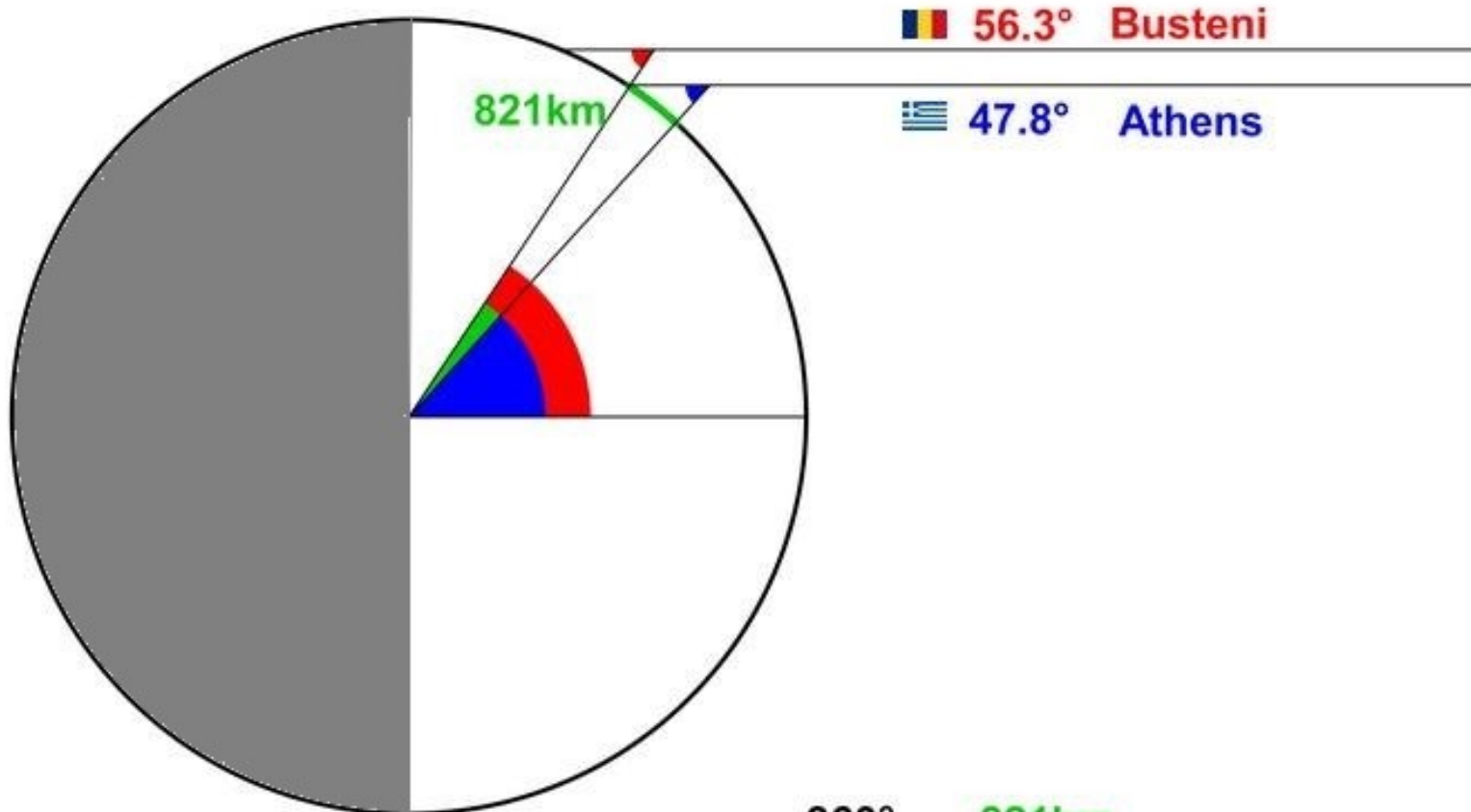


Flag	City	Country	School	Latitude (°) +N/-S	Longitude (°) +E/-W
	Athens	Greece	Experimental College Agion Anargyron	38.027	23.726

Date	Gnomon	Shadow	Angle
21 October 2019	49.0cm	54.0cm	47.8°

21/10/2019 (Busteni-Romania) Latitude: 45.416°

21/10/2019 (Athens-Greece) Latitude: 38.027°



 56.3° Busteni

 47.8° Athens

821km


$$\text{circumference} = \frac{360^\circ \times 821\text{km}}{56.3^\circ - 47.8^\circ} = 34772 \text{ km}$$

Distance	Angle
circumference	360°
821km	56.3° - 47.8°



Buenos Aires 1, Argentina

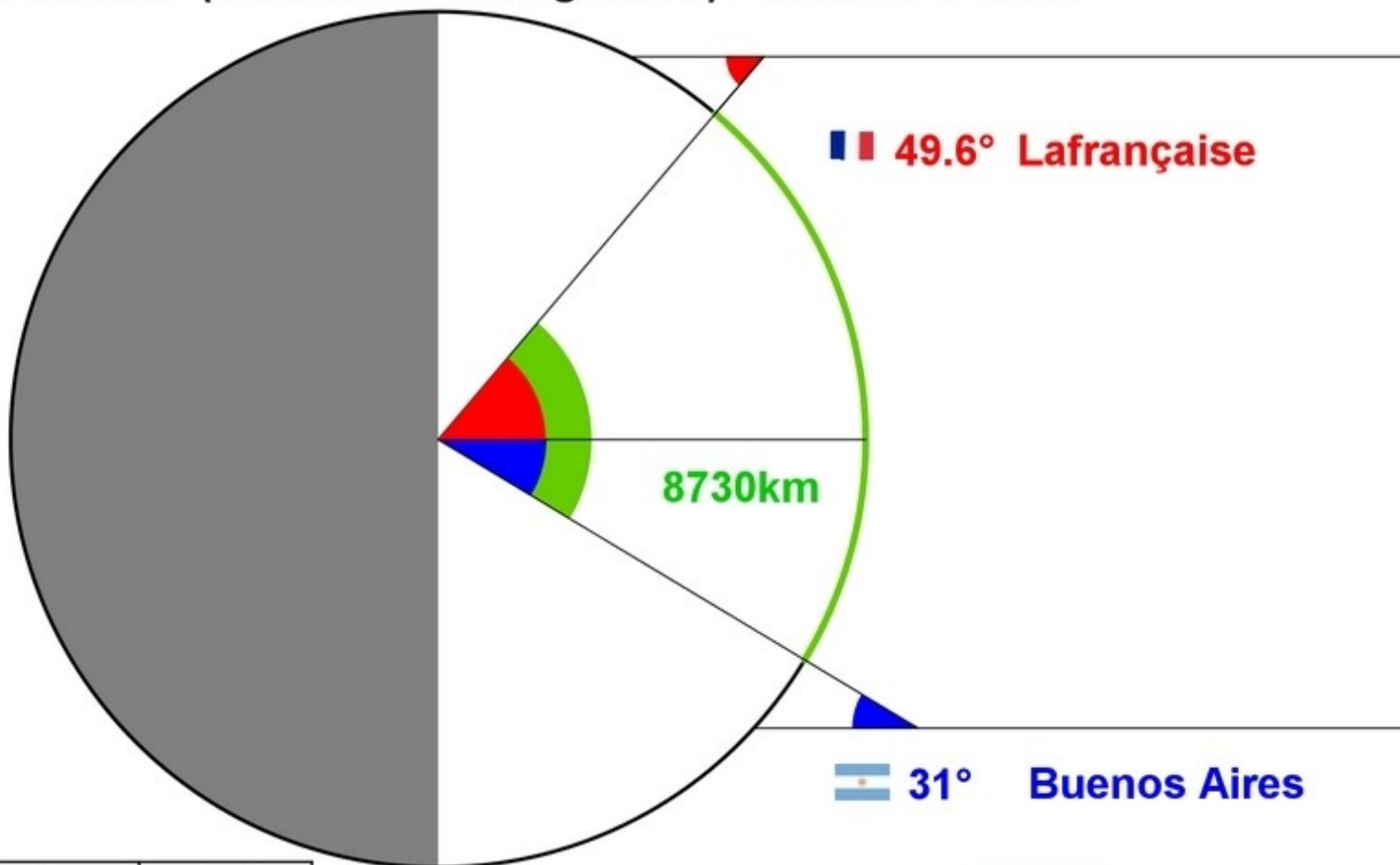


Flag	City	Country	School	Latitude (°) +N/-S	Longitude (°) +E/-W
	Buenos Aires ENS1	Argentina	ENS N° 1	-34.455	-58.544

Date	Gnomon	Shadow	Angle
07 October 2019	7.5cm	-4.5cm	-31°
08 October 2019	7.5cm	-8.0cm	-46.8°
09 October 2019	7.5cm	-3.9cm	-27.5°
18 October 2019	7.5cm	-3.0cm	-21.8°

07/10/2019 (Lafrançaise-France) Latitude: 44.127°

07/10/2019 (Buenos Aires-Argentina) Latitude: -34.455°




Distance	Angle
circumference	360°
8730km	49.6°+31°

$$\text{circumference} = \frac{360^\circ \times 8730\text{km}}{49.6^\circ + 31^\circ} = 38993 \text{ km}$$



Busteni, Romania

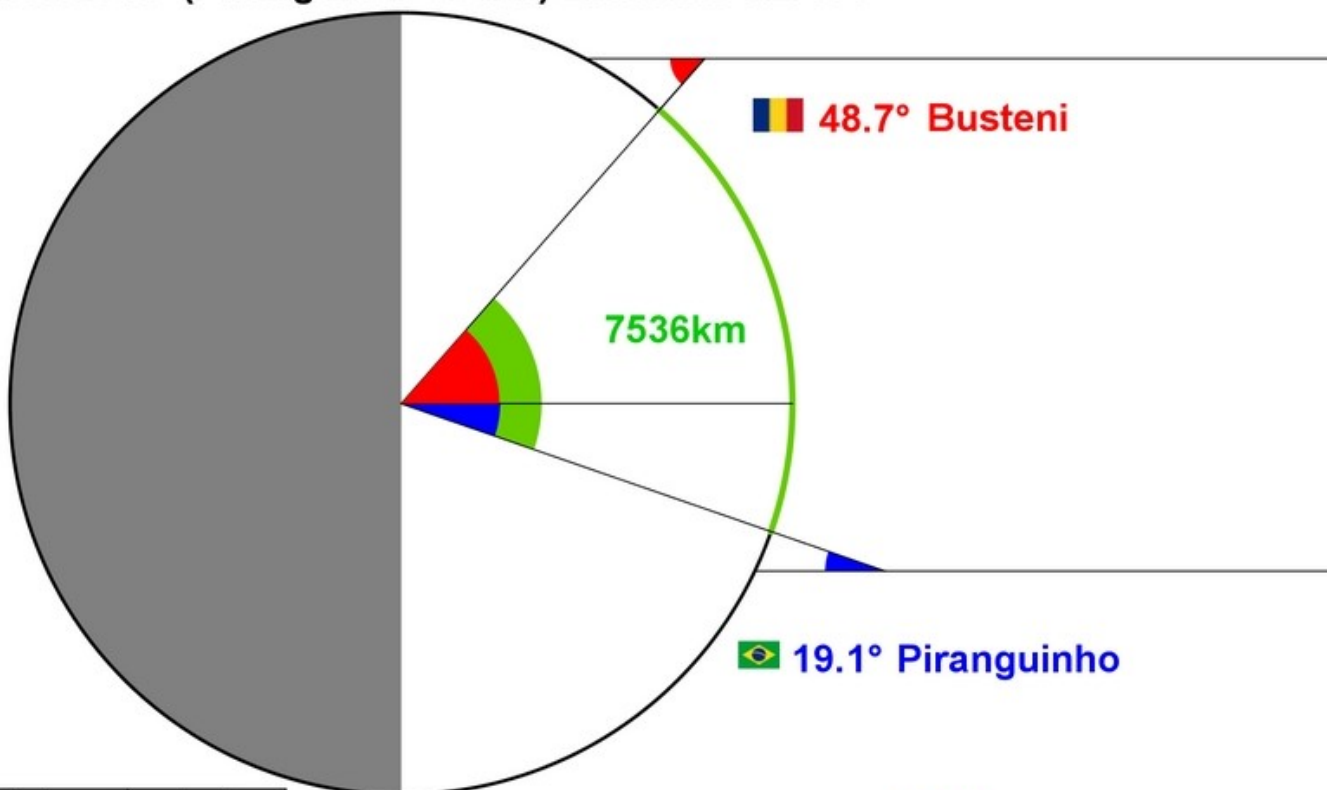


Flag	City	Country	School	Latitude (°) +N/-S	Longitude (°) +E/-W
	Busteni	Romania	Colegiul Ion Kalinderu	45.416	25.535

Date	Gnomon	Shadow	Angle
01 October 2019	100.0cm	113.8cm	48.7°
02 October 2019	100.0cm	115.4cm	49.1°
03 October 2019	100.0cm	117.1cm	49.5°
08 October 2019	100cm	125.5cm	51.5°
09 October 2019	100.0cm	127.3cm	51.8°
10 October 2019	100.0cm	129.1cm	52.2°
14 October 2019	100.0cm	136.4cm	53.8°
15 October 2019	100.0cm	138.3cm	54.1°
16 October 2019	100.0cm	140.2cm	54.5°
18 October 2019	100.0cm	144.1cm	55.2°
21 October 2019	100.0cm	150.1cm	56.3°
22 October 2019	100.0cm	152.2cm	56.7°
23 October 2019	100.0cm	154.2cm	57.0°
24 October 2019	100.0cm	156.3cm	57.4°
25 October 2019	100.0cm	158.4cm	57.7°
28 October 2019	100.0cm	164.9cm	58.8°

01/10/2019 (Busteni-Romania) Latitude: 45.416°

01/10/2019 (Piranguinho-Brazil) Latitude: -22.411°




Distance	Angle
circumference	360°
7536km	48.7°+19.1°

$$\text{circumference} = \frac{360^\circ \times 7536\text{km}}{48.7^\circ + 19.1^\circ} = 40014 \text{ km}$$



Chivilcoy, Argentina

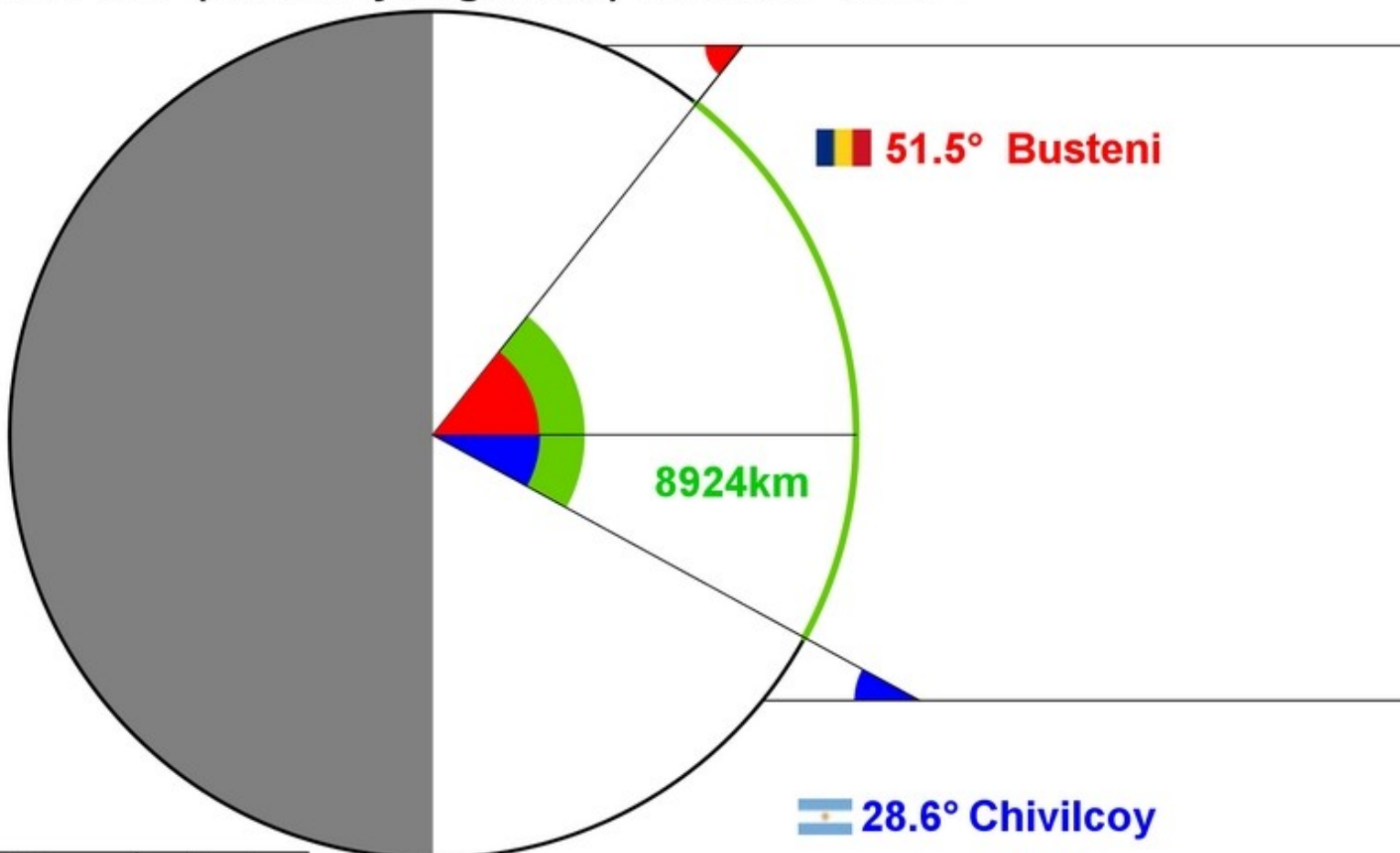


Flag	City	Country	School	Latitude (°) +N/-S	Longitude (°) +E/-W
	Chivilcoy	Argentina	Parque Cielos del Sur	-34.911	-60.014

Date	Gnomon	Shadow	Angle
08 October 2019	101.0cm	-55.0cm	-28.6°

08/10/2019 (Busteni-Romania) Latitude: 45.416°

08/10/2019 (Chivilcoy-Argentina) Latitude: -34.911°



 **51.5° Busteni**

 **28.6° Chivilcoy**

$$\text{circumference} = \frac{360^\circ \times 8924\text{km}}{51.5^\circ + 28.6^\circ} = 40108 \text{ km}$$

Distance	Angle
circumference	360°
8924km	51.5° + 28.6°



Frontino, Colombia

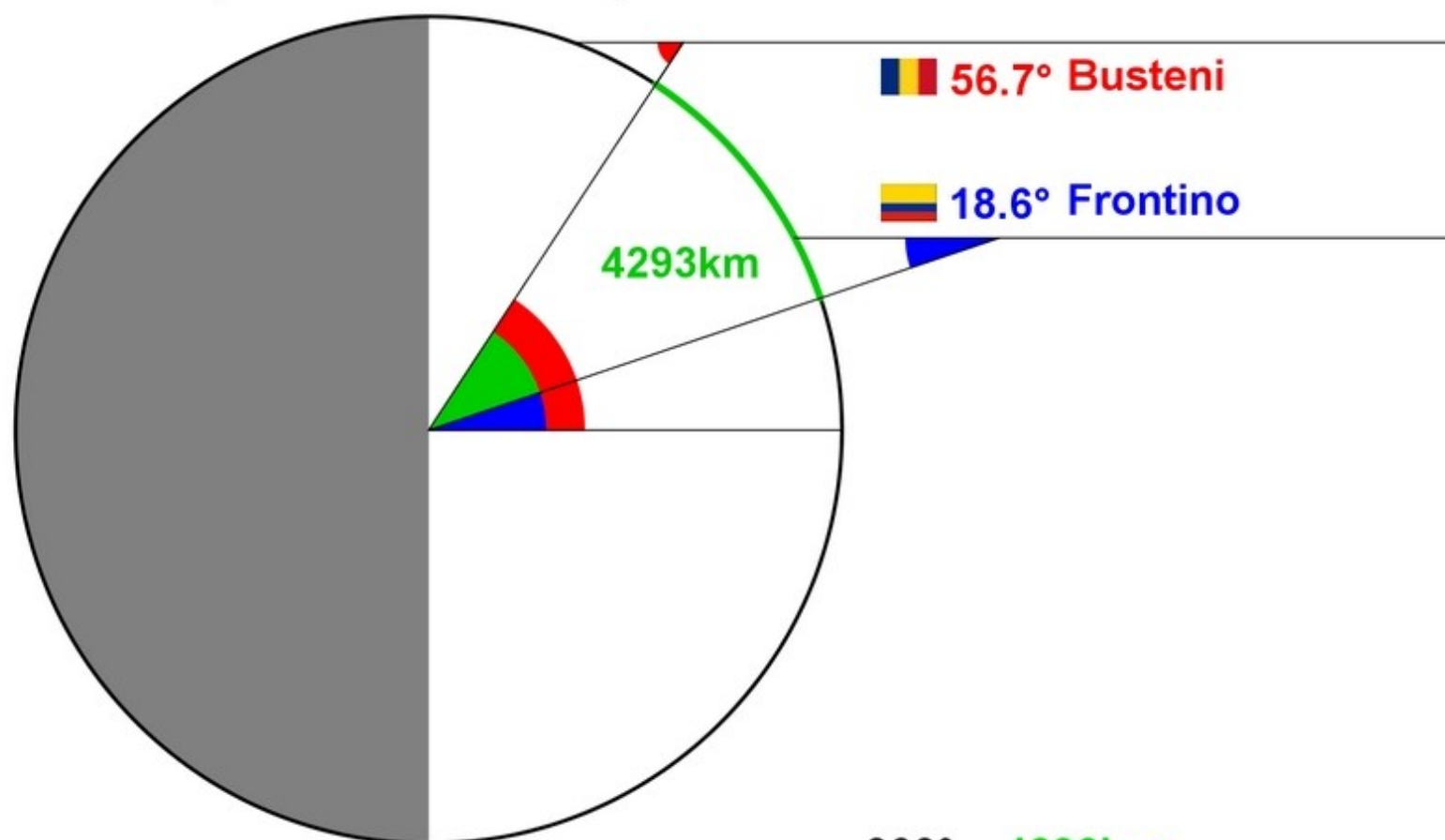


Flag	City	Country	School	Latitude (°) +N/-S	Longitude (°) +E/-W
	Frontino	Colombia	Astronomy Club Astrofron	6.777	-76.132

Date	Gnomon	Shadow	Angle
22 October 2019	28.0cm	9.4cm	18.6°
28 October 2019	112cm	47cm	22.8°

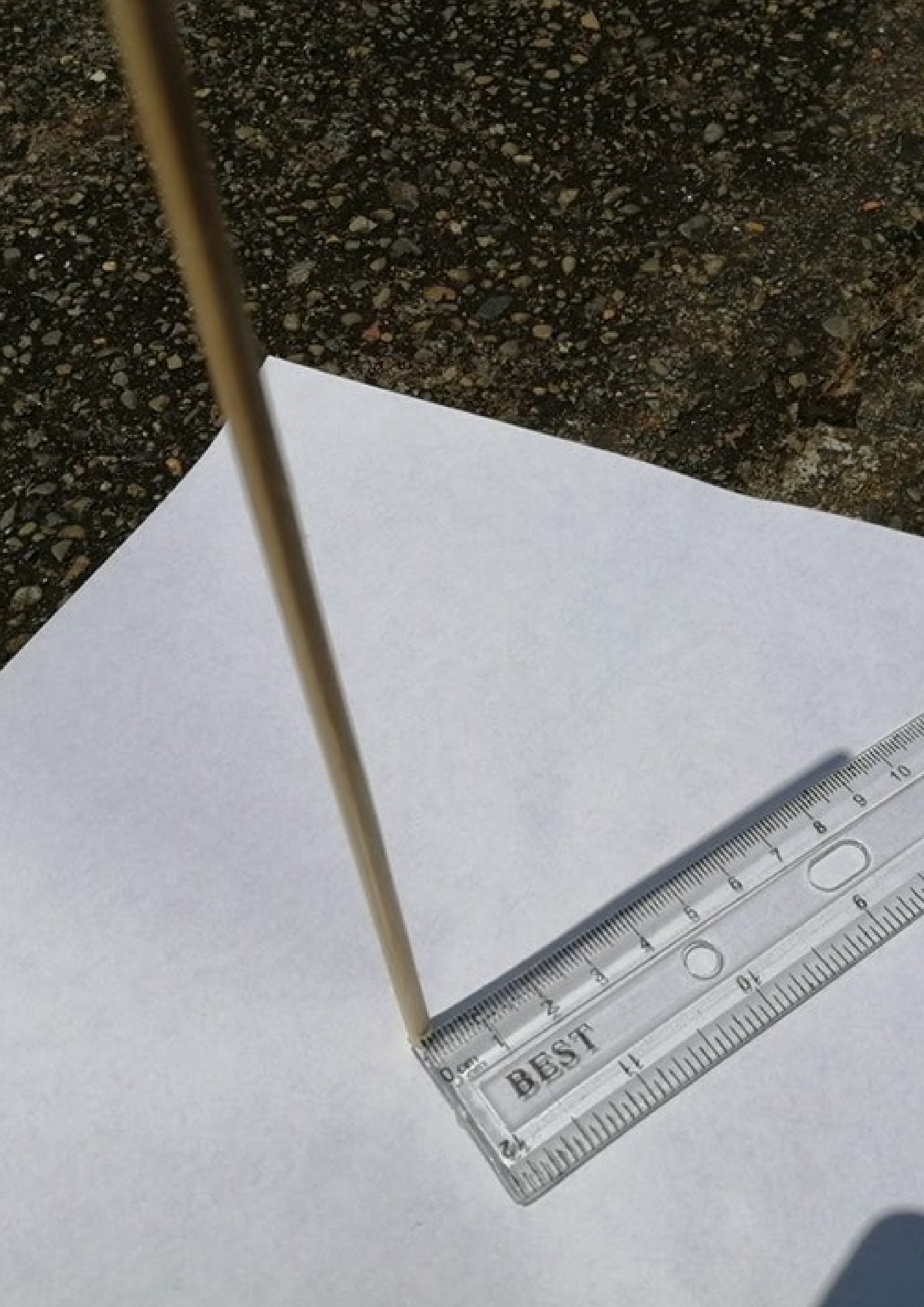
22/10/2019 (Busteni-Romania) Latitude: 45.416°

22/10/2019 (Frontino-Colombia) Latitude: 6.777°



Distance	Angle
circumference	360°
4293km	56.7° - 18.6°

$$\text{circumference} = \frac{360^\circ \times 4293\text{km}}{56.7^\circ - 18.6^\circ} = 40564 \text{ km}$$



Guarne, Colombia

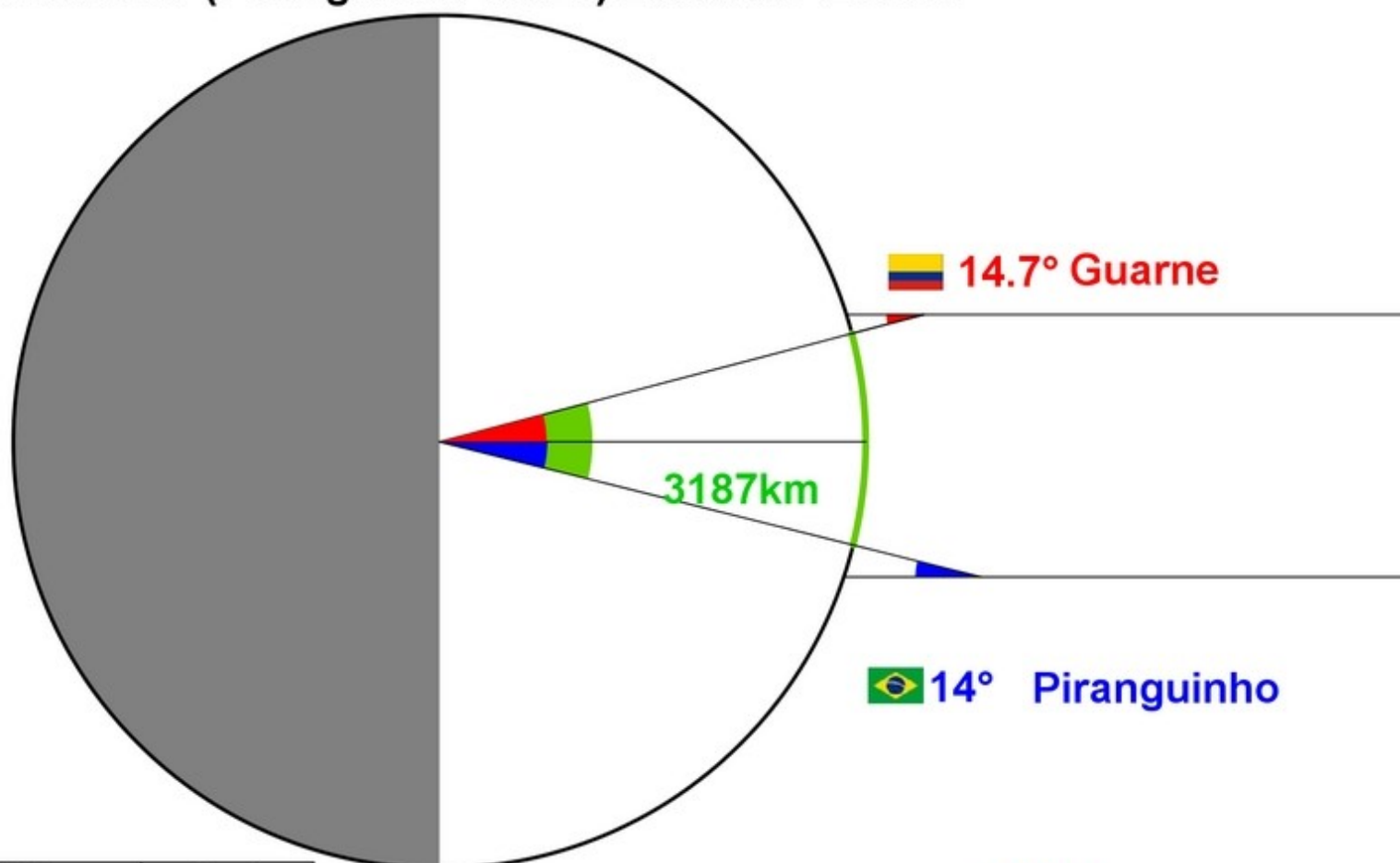


Flag	City	Country	School	Latitude (°) +N/-S	Longitude (°) +E/-W
	Guarne	Colombia	Grupo Astrofanáticos	6.274	-75.449

Date	Gnomon	Shadow	Angle
04 October 2019	30.5cm	5.5cm	10.2°
14 October 2019	13.0cm	3.4cm	14.7°
18 October 2019	30.5cm	8.7cm	15.9°

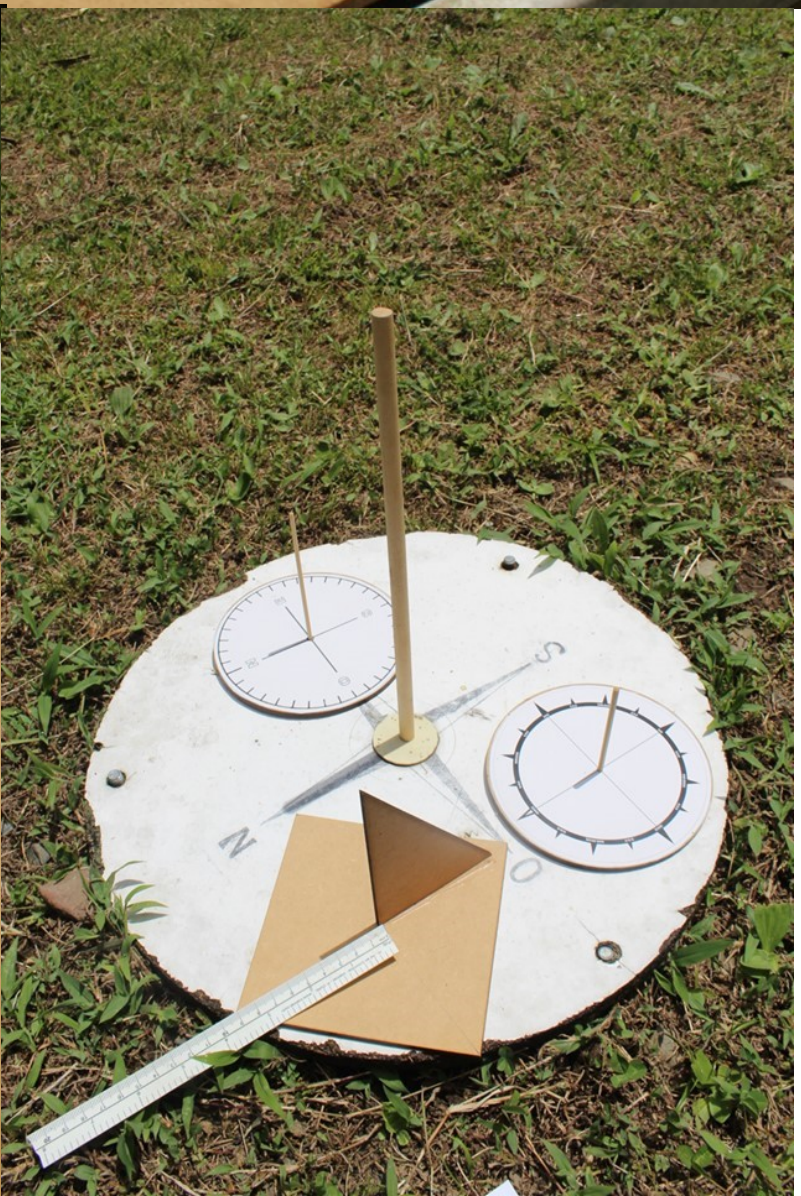
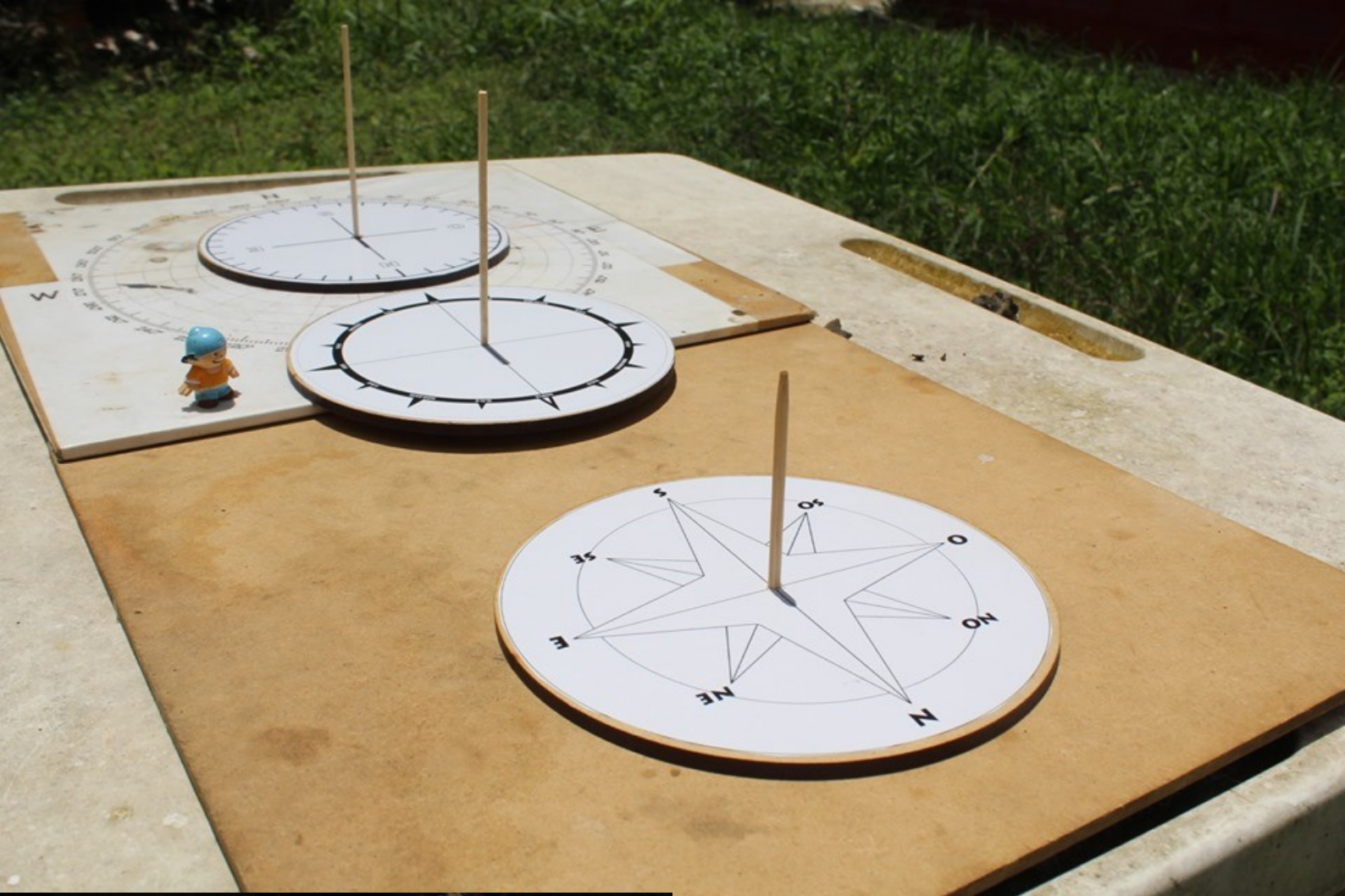
14/10/2019 (Guarne-Colombia) Latitude: 6.274°

14/10/2019 (Piranguinho-Brazil) Latitude: -22.411°




Distance	Angle
circumference	360°
3187km	14.7° + 14°

$$\text{circumference} = \frac{360^\circ \times 3187\text{km}}{14.7^\circ + 14^\circ} = 39976 \text{ km}$$



Hồ Chí Minh City NT, Việt Nam

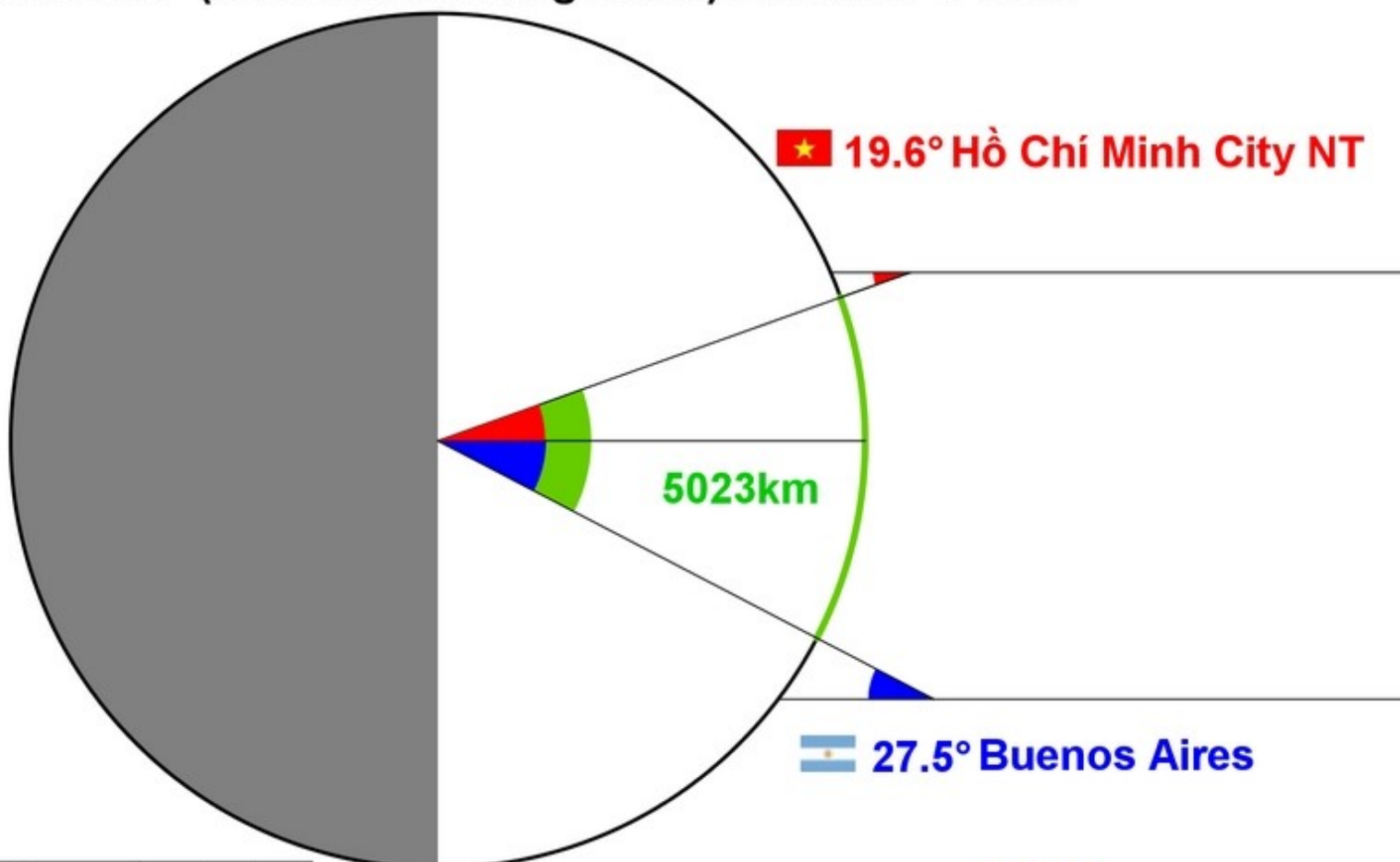


Flag	City	Country	School	Latitude (°) +N/-S	Longitude (°) +E/-W
	Hồ Chí Minh City NT	Việt Nam	Nguyen Trai High School	10.760	106.712

Date	Gnomon	Shadow	Angle
08 October 2019	81.8cm	13.2cm	9.2°
09 October 2019	63.8cm	22.7cm	19.6°
10 October 2019	84.6cm	24.1cm	15.9°

09/10/2019 (Hồ Chí Minh City NT-Việt Nam) Latitude: 10.76°

09/10/2019 (Buenos Aires-Argentina) Latitude: -34.455°



Distance	Angle
circumference	360°
5023km	19.6°+27.5°

$$\text{circumference} = \frac{360^\circ \times 5023\text{km}}{19.6^\circ + 27.5^\circ} = 38392 \text{ km}$$



Ilion 11, Greece

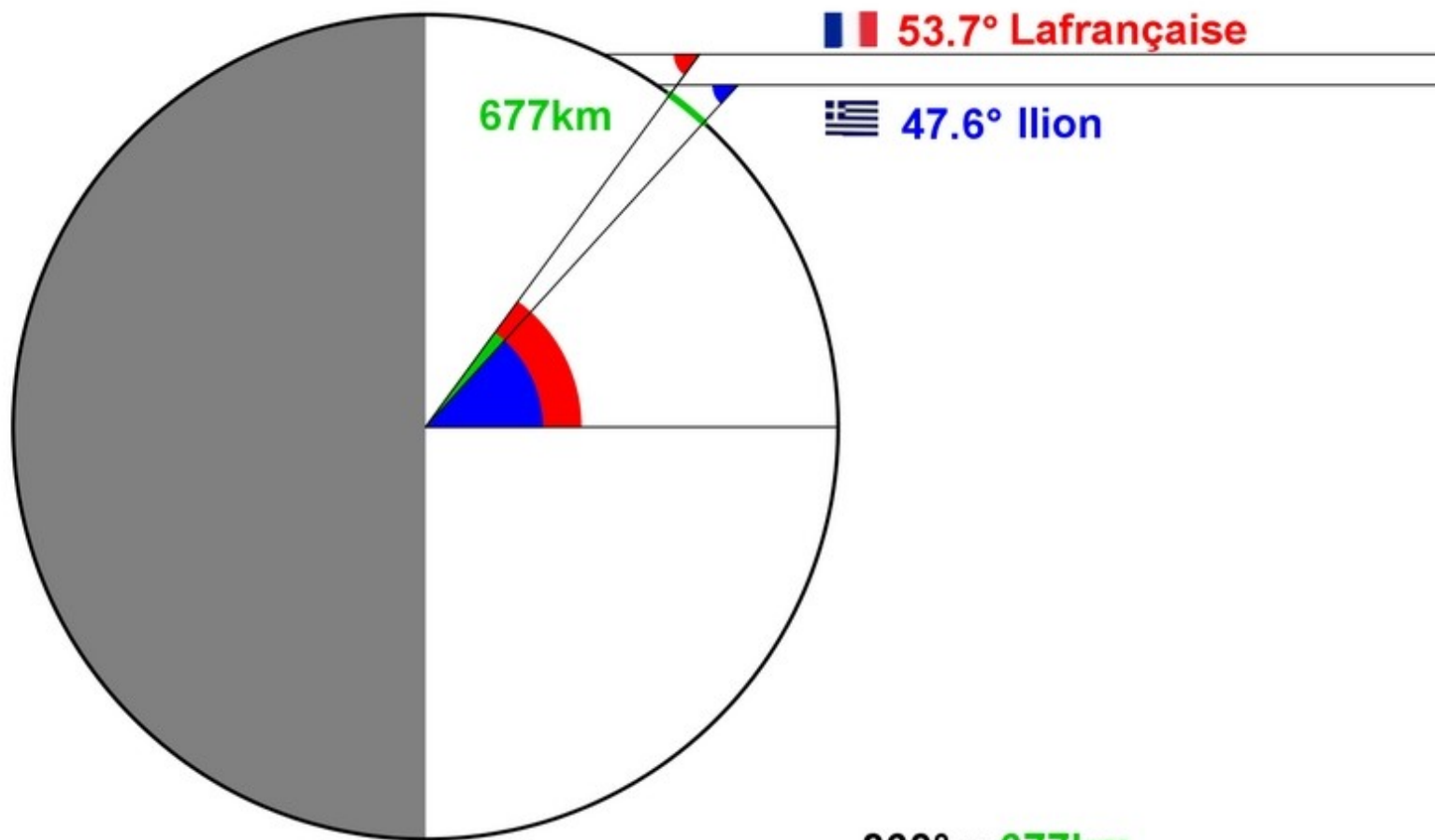


Flag	City	Country	School	Latitude (°) +N/-S	Longitude (°) +E/-W
	Ilion	Greece	11th JuniorHigh School of Ilion	38.033	23.697

Date	Gnomon	Shadow	Angle
18 October 2019	36.0cm	39.4cm	47.6°

18/10/2019 (Lafrançaise-France) Latitude: 44.127°

18/10/2019 (Ilion-Greece) Latitude: 38.033°

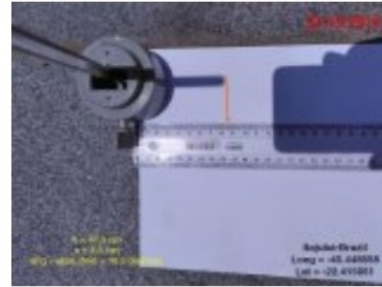


Distance	Angle
circumference	360°
677km	53.7° - 47.6°

$$\text{circumference} = \frac{360^\circ \times 677\text{km}}{53.7^\circ - 47.6^\circ} = 39954 \text{ km}$$



Itajubá, Brazil

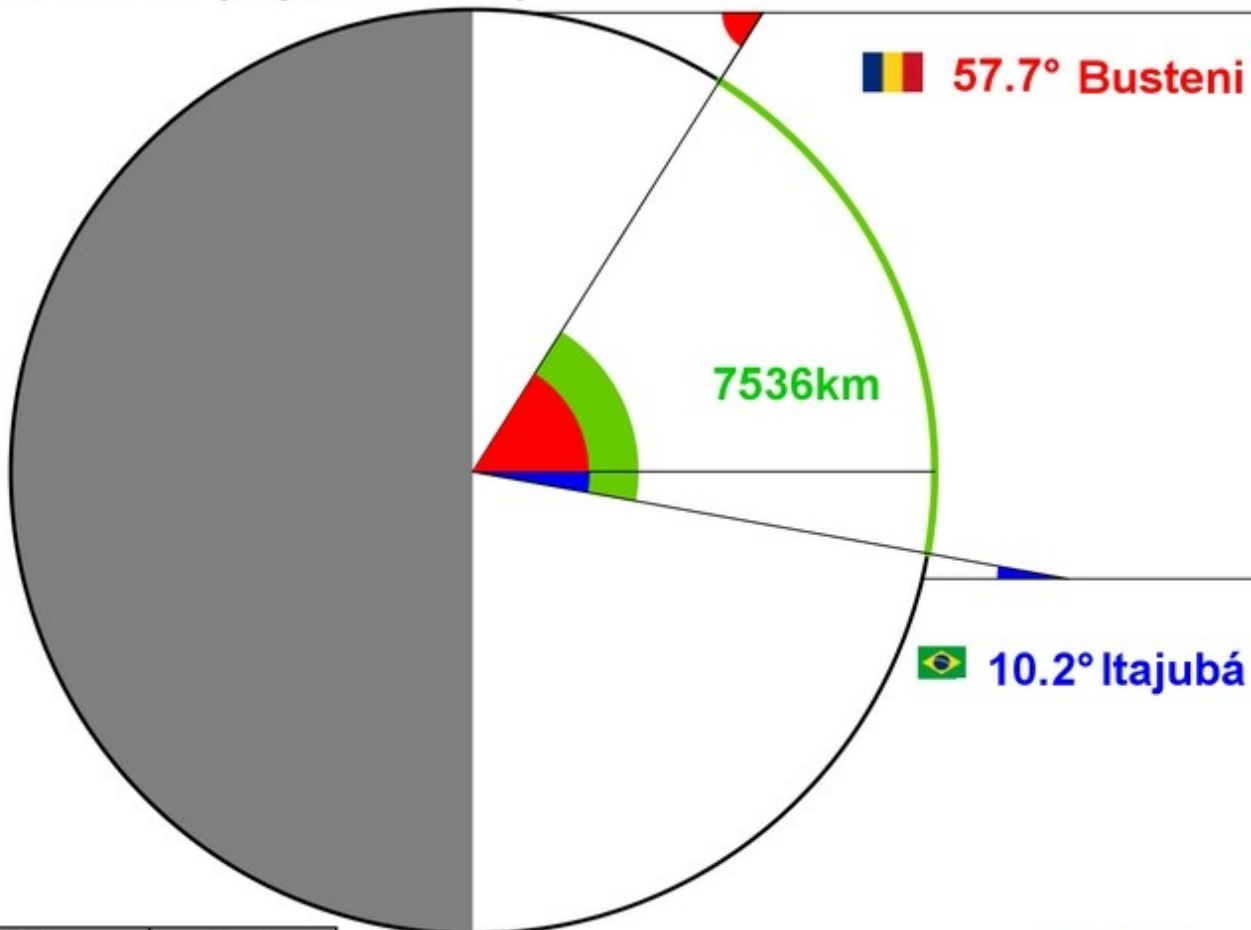


Flag	City	Country	School	Latitude (°) +N/-S	Longitude (°) +E/-W
	Itajubá	Brazil	Universidade Federal de Itajubá	-22.415	-45.449

Date	Gnomon	Shadow	Angle
25 October 2019	47.3cm	-8.5cm	-10.2°

25/10/2019 (Busteni-Romania) Latitude: 45.416°

25/10/2019 (Itajubá-Brazil) Latitude: -22.415°



Distance	Angle
circumference	360°
7536km	57.7° + 10.2°

$$\text{circumference} = \frac{360^\circ \times 7536\text{km}}{57.7^\circ + 10.2^\circ} = 39955 \text{ km}$$

25.10.2019



$h = 47.3 \text{ cm}$
 $s = 8.5 \text{ cm}$
 $\text{ang} = \text{atan}(h/s) = 10.2 \text{ degrees}$

Itajubá-Brazil
Long = -45.448558
Lat = -22.415051



Jajjah Abbasian, Pakistan



Flag	City	Country	School	Latitude (°) +N/-S	Longitude (°) +E/-W
	Jajjah Abbasian	Pakistan	Government Boys Secondary School	28.754	70.569

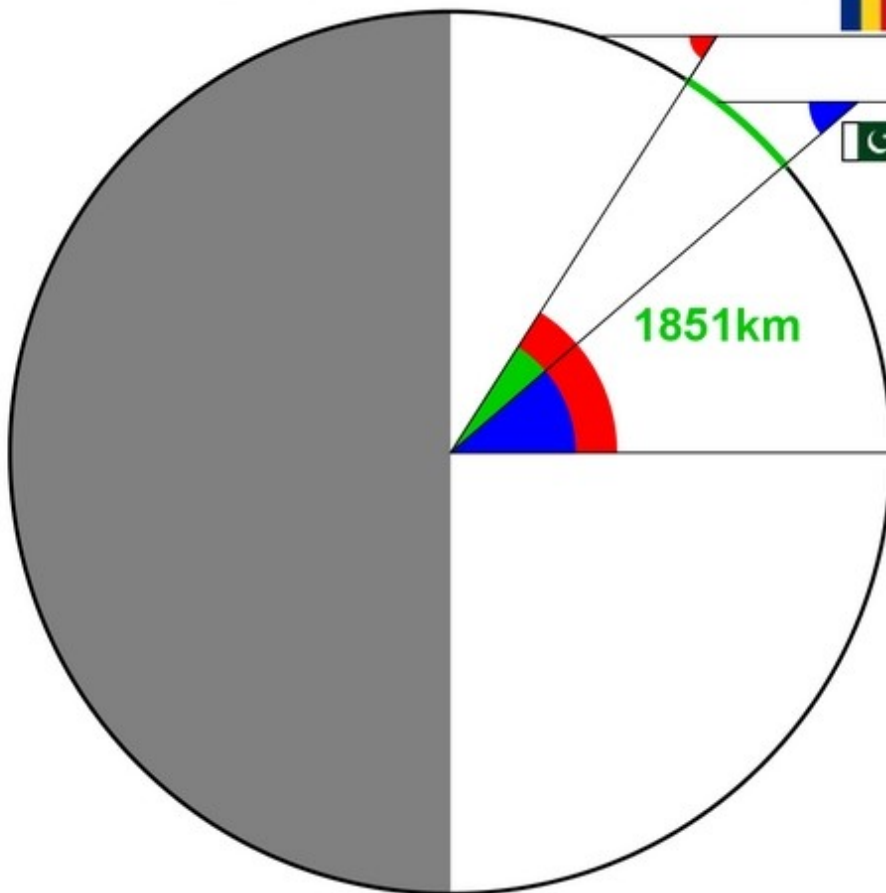
Date	Gnomon	Shadow	Angle
23 October 2019	100.0cm	85.0cm	40.4°
24 October 2019	100.0cm	86.1cm	40.7°
25 October 2019	100cm	87.2cm	41.1°

24/10/2019 (Busteni-Romania) Latitude: 45.416°

24/10/2019 (Jajjah Abbasian-Pakistan) Latitude: 28.754°

57.4° Busteni

40.7° Jajjah Abbasian



$$\text{circumference} = \frac{360^\circ \times 1851\text{km}}{57.4^\circ - 40.7^\circ} = 39902 \text{ km}$$

Distance	Angle
circumference	360°
1851km	57.4° - 40.7°



Lafrançaise, France

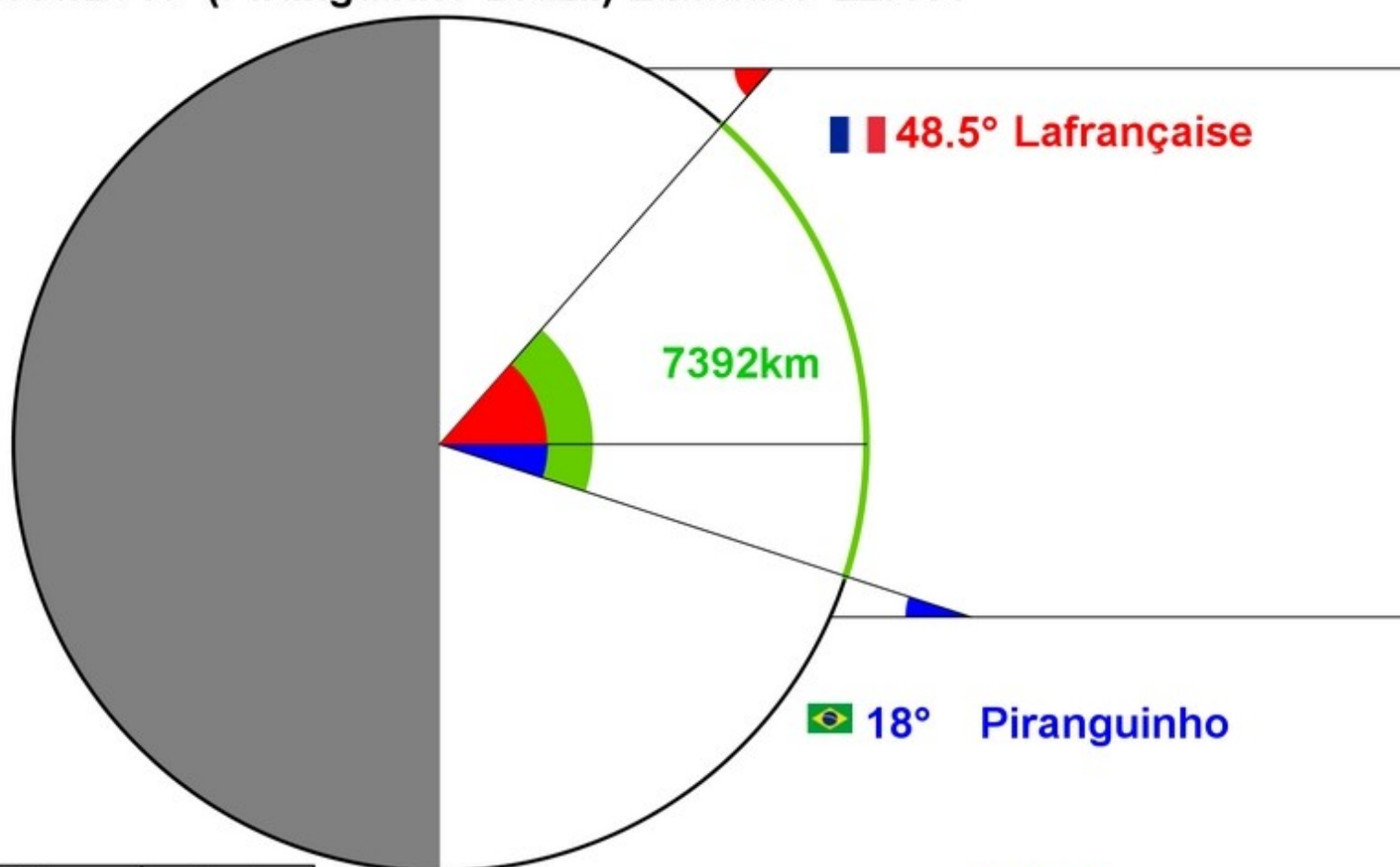


Flag	City	Country	School	Latitude (°) +N/-S	Longitude (°) +E/-W
	Lafrançaise	France	Collège Antonin Perbosc	44.127	1.237

Date	Gnomon	Shadow	Angle
03 October 2019	100.0cm	113.0cm	48.5°
04 October 2019	100.0cm	114.0cm	48.7°
07 October 2019	100cm	117.7cm	49.6°
10 October 2019	100cm	125.3cm	51.4°
11 October 2019	100cm	124cm	51.1°
18 October 2019	100.0cm	136.0cm	53.7°

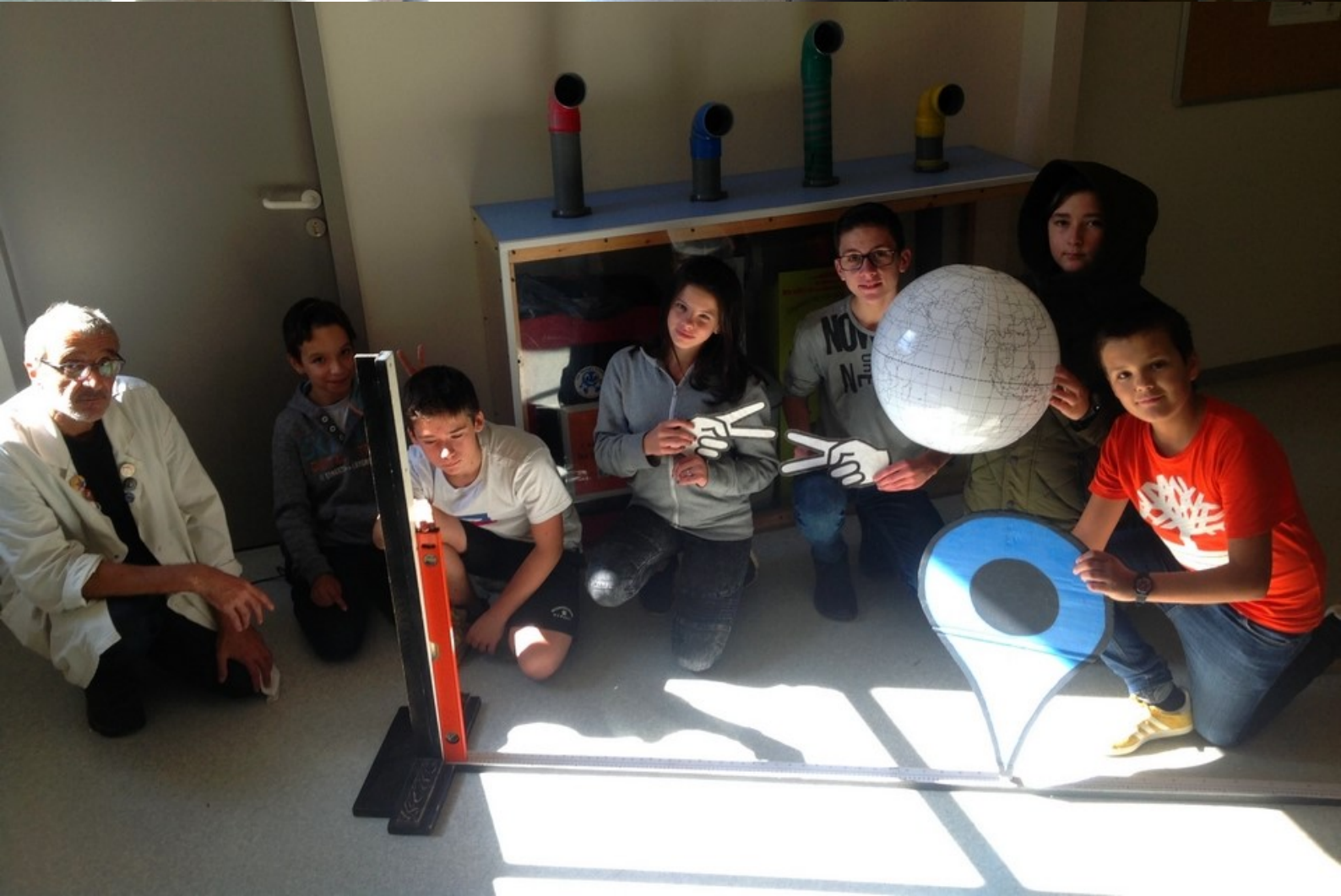
03/10/2019 (Lafrançaise-France) Latitude: 44.127°

03/10/2019 (Piranguinho-Brazil) Latitude: -22.411°



Distance	Angle
circumference	360°
7392km	48.5° + 18°

$$\text{circumference} = \frac{360^\circ \times 7392\text{km}}{48.5^\circ + 18^\circ} = 40017 \text{ km}$$



Mărgineni, Romania

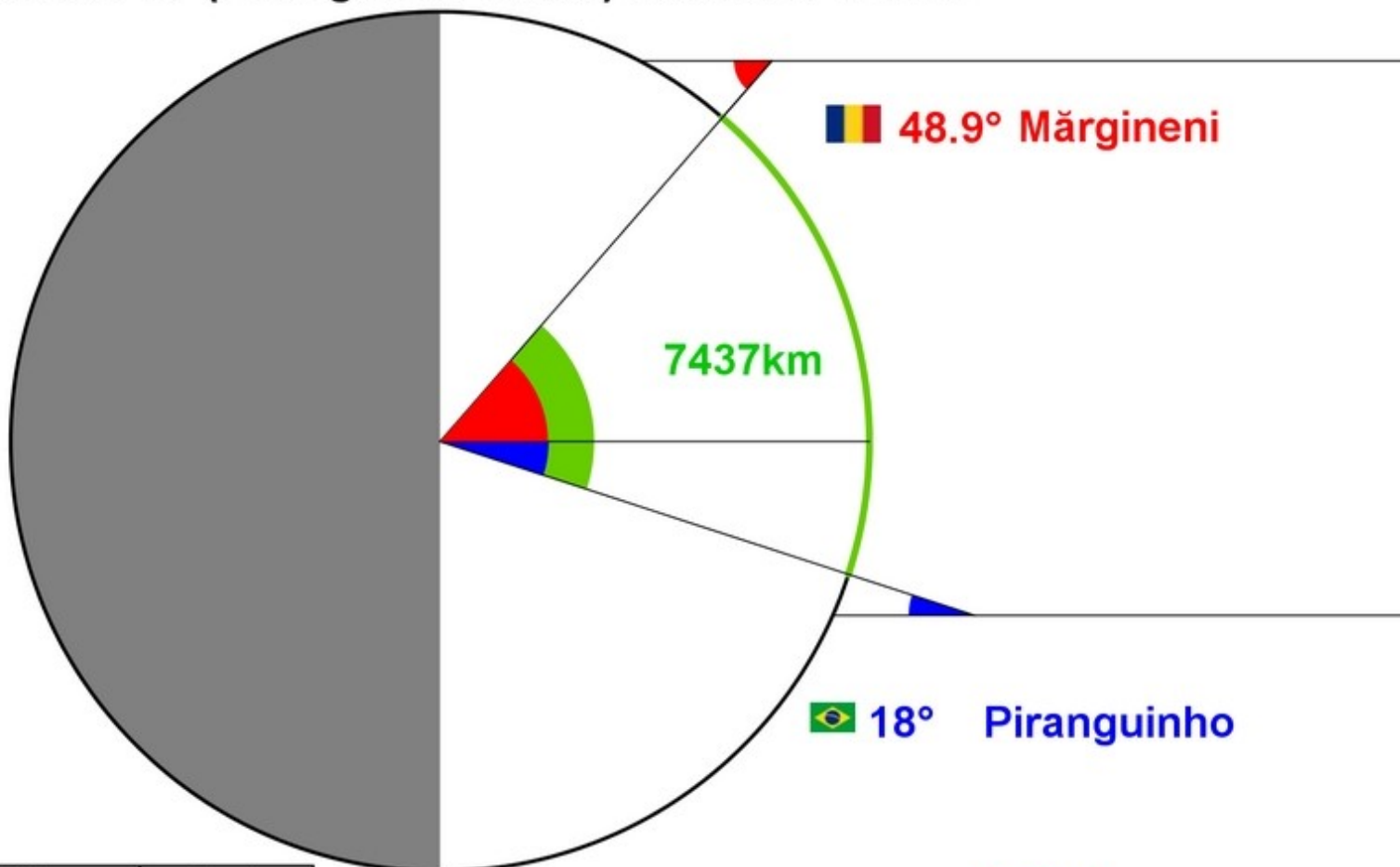


Flag	City	Country	School	Latitude (°) +N/-S	Longitude (°) +E/-W
	Mărgineni	Romania	Gh. Popescu School	44.533	24.554

Date	Gnomon	Shadow	Angle
03 October 2019	100.0cm	114.7cm	48.9°
08 October 2019	100cm	121.9cm	50.6°
16 October 2019	100.0cm	128.0cm	52.0°

03/10/2019 (Mărgineni-Romania) Latitude: 44.533°

03/10/2019 (Piranguinho-Brazil) Latitude: -22.411°




Distance	Angle
circumference	360°
7437km	48.9° + 18°

$$\text{circumference} = \frac{360^\circ \times 7437\text{km}}{48.9^\circ + 18^\circ} = 40020 \text{ km}$$



Petroupoli, Greece

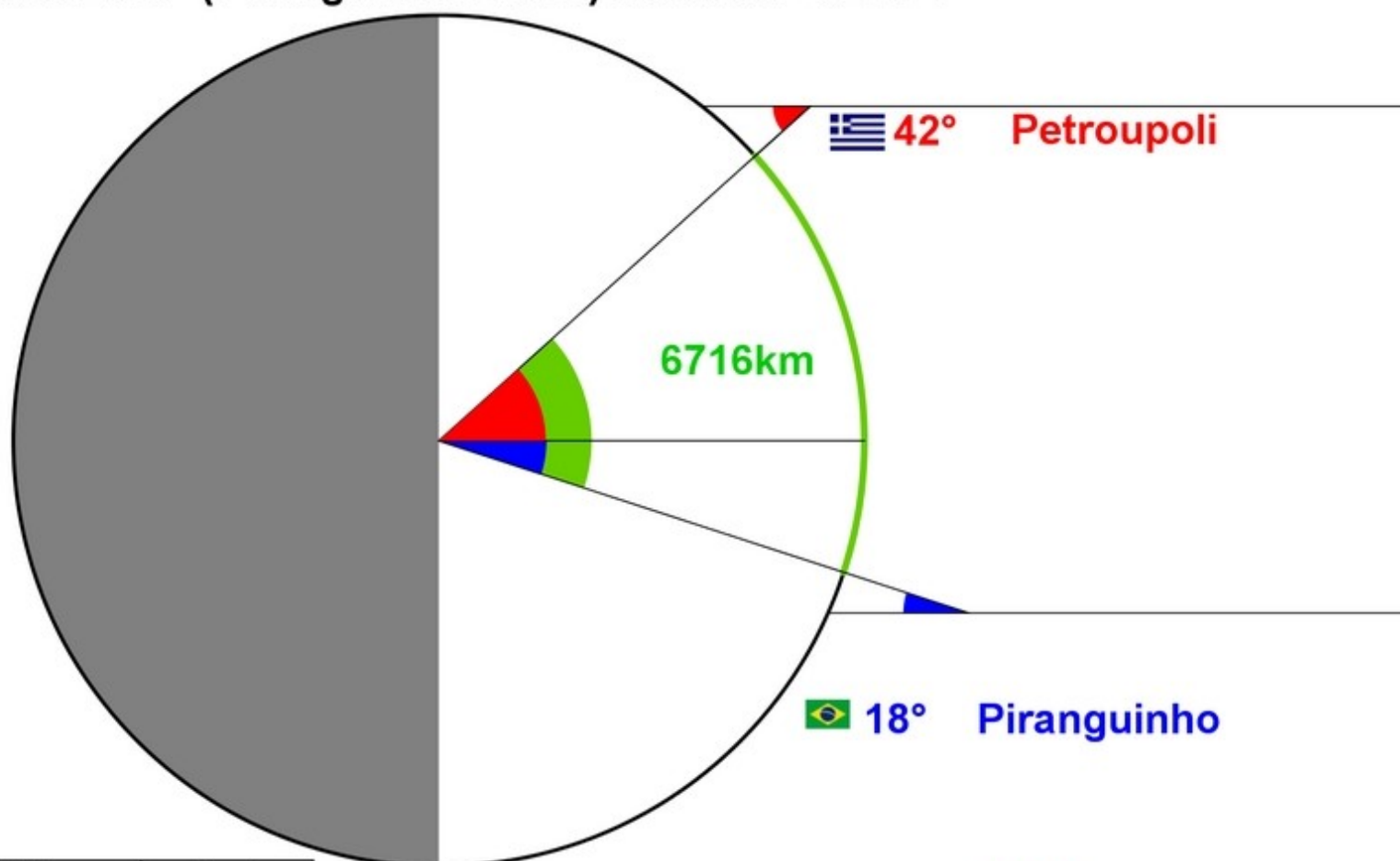


Flag	City	Country	School	Latitude (°) +N/-S	Longitude (°) +E/-W
	Petroupoli	Greece	4o Junior High School	38.036	23.674

Date	Gnomon	Shadow	Angle
03 October 2019	52.3cm	47.1cm	42.0°
07 October 2019	52.3cm	49.5cm	43.4°
14 October 2019	52.3cm	54.0cm	45.9°
31 October 2019	52.3cm	67.5cm	52.2°

03/02/2019 (Petroupoli-Greece) Latitude: 38.036°

03/10/2019 (Piranguinho-Brazil) Latitude: -22.411°

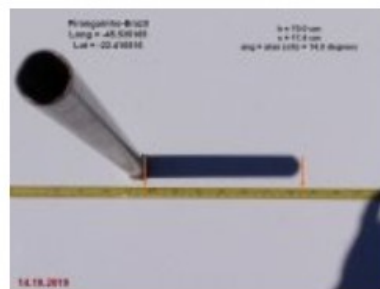


Distance	Angle
circumference	360°
6716km	42° + 18°

$$\text{circumference} = \frac{360^\circ \times 6716\text{km}}{42^\circ + 18^\circ} = 40296 \text{ km}$$



Piranguinho, Brazil

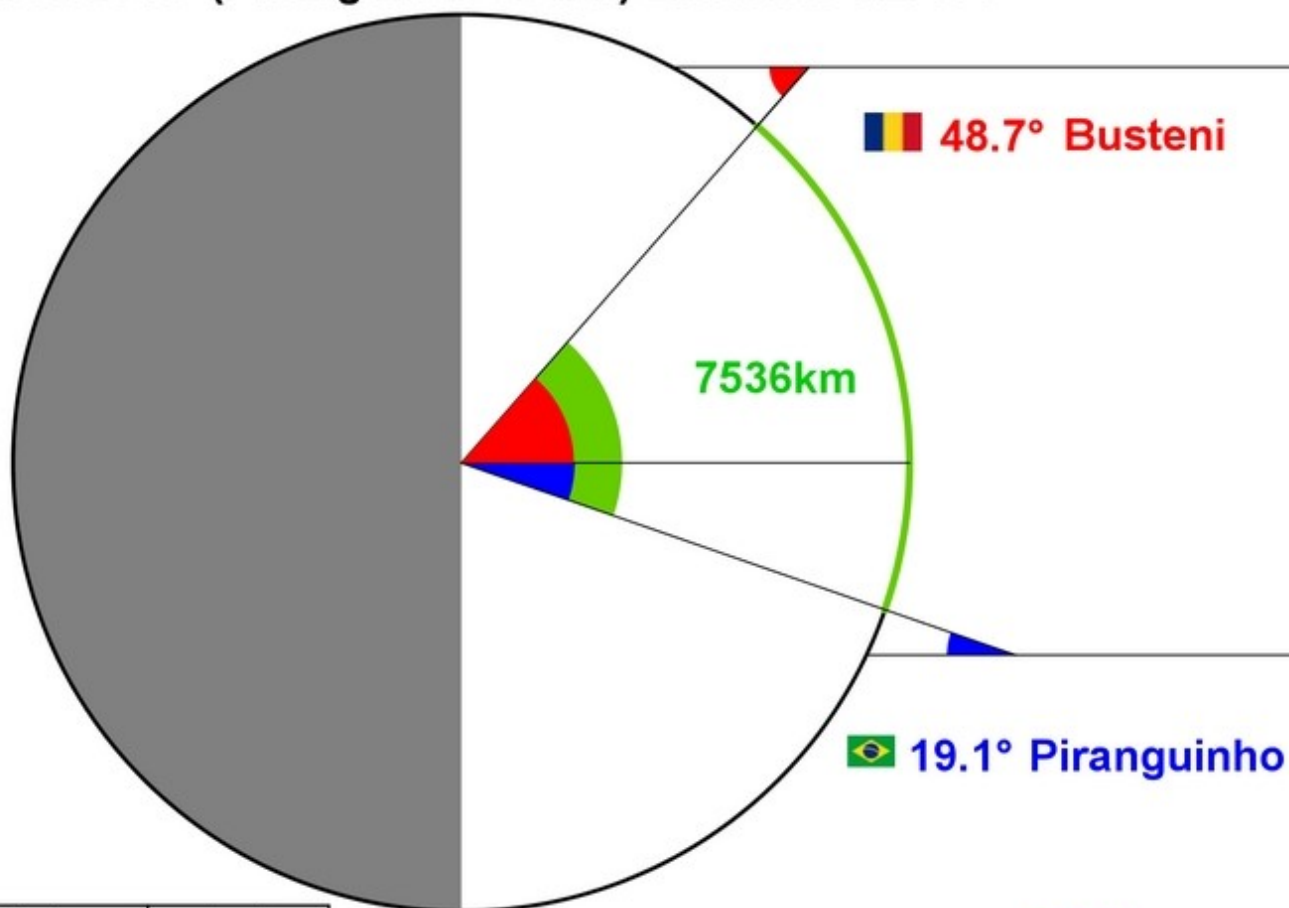


Flag	City	Country	School	Latitude (°) +N/-S	Longitude (°) +E/-W
	Piranguinho	Brazil	Universidade Federal de Itajubá	-22.411	-45.535

Date	Gnomon	Shadow	Angle
01 October 2019	70.0cm	-24.2cm	-19.1°
03 October 2019	70.0cm	-22.8cm	-18.0°
04 October 2019	70.0cm	-23.2cm	-18.3°
11 October 2019	70cm	-19.6cm	-15.6°
14 October 2019	70.0cm	-17.4cm	-14.0°
29 October 2019	70.0cm	-10.9cm	-8.9°

01/10/2019 (Busteni-Romania) Latitude: 45.416°

01/10/2019 (Piranguinho-Brazil) Latitude: -22.411°



Distance	Angle
circumference	360°
7536km	48.7° + 19.1°

$$\text{circumference} = \frac{360^\circ \times 7536\text{km}}{48.7^\circ + 19.1^\circ} = 40014 \text{ km}$$

Piranguinho-Brazil

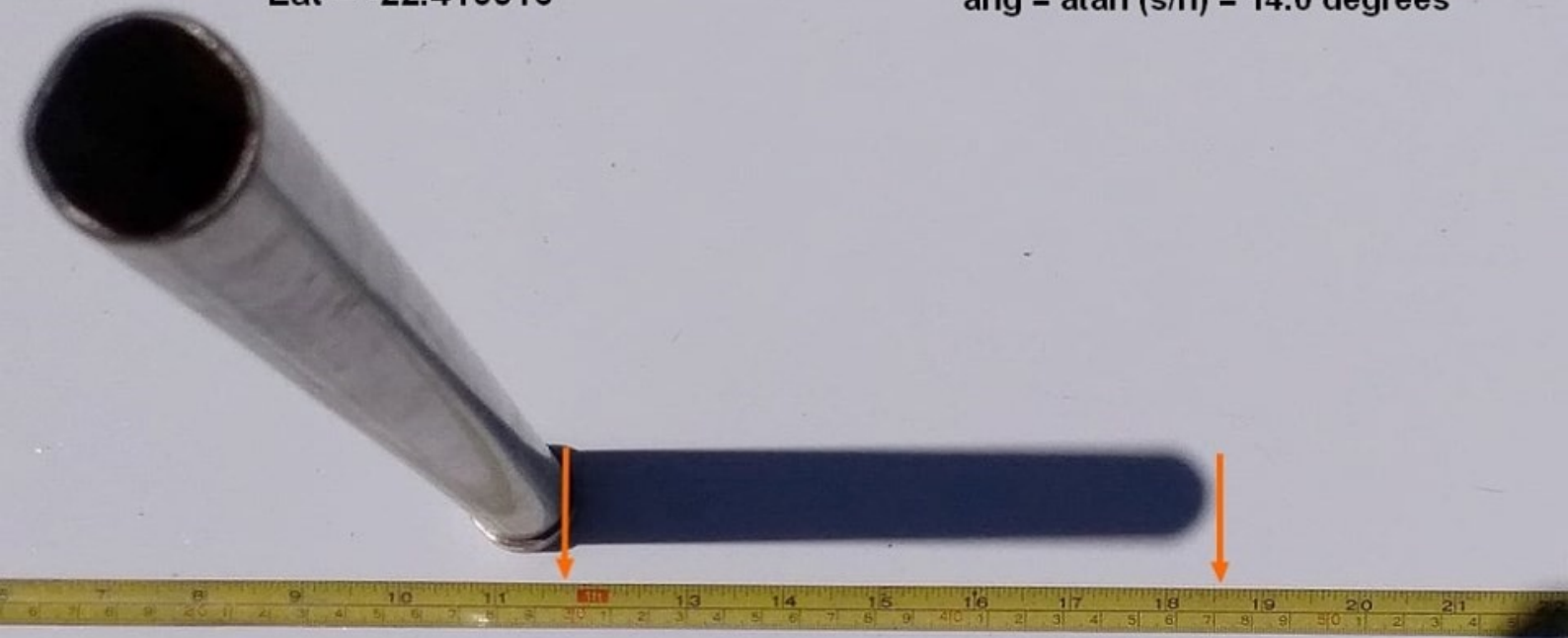
Long = -45.535165

Lat = -22.410516

$h = 70.0 \text{ cm}$

$s = 17.4 \text{ cm}$


$\text{ang} = \text{atan}(s/h) = 14.0 \text{ degrees}$



14.10.2019

Rio de Janeiro CENOM, Brazil

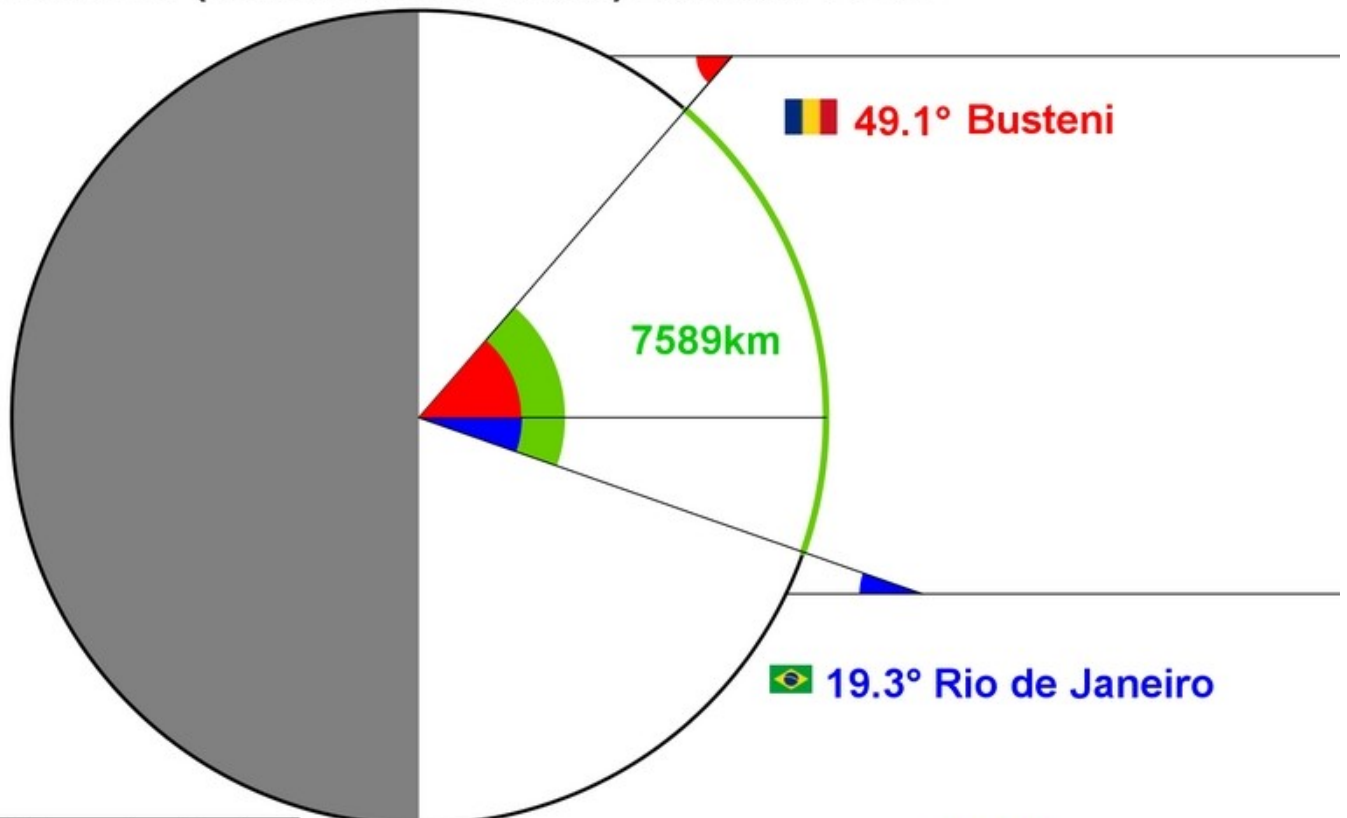


Flag	City	Country	School	Latitude (°) +N/-S	Longitude (°) +E/-W
	Rio de Janeiro	Brazil	Centro Educacional Nosso Mundo	-22.890	-43.317

Date	Gnomon	Shadow	Angle
01 October 2019	20.0cm	-7.0cm	-19.3°
02 October 2019	20.0cm	-7.0cm	-19.3°
03 October 2019	20.0cm	-7.0cm	-19.3°
04 October 2019	20.0cm	-7.0cm	-19.3°
11 October 2019	20cm	-6cm	-16.7°
14 October 2019	20.0cm	-6.0cm	-16.7°
15 October 2019	20.0cm	-6.0cm	-16.7°
16 October 2019	20.0cm	-6.0cm	-16.7°
22 October 2019	20.0cm	-5.0cm	-14.0°
24 October 2019	20.0cm	-4.0cm	-11.3°
25 October 2019	20.0cm	-5.0cm	-14.0°
28 October 2019	20.0cm	-4.0cm	-11.3°
29 October 2019	20.0cm	-4.0cm	-11.3°
30 October 2019	20.0cm	-4.0cm	-11.3°
31 October 2019	20.0cm	-4.0cm	-11.3°

02/10/2019 (Busteni-Romania) Latitude: 45.416°

02/10/2019 (Rio de Janeiro-Brazil) Latitude: -22.89°




Distance	Angle
circumference	360°
7589km	49.1° + 19.3°

$$\text{circumference} = \frac{360^\circ \times 7589\text{km}}{49.1^\circ + 19.3^\circ} = 39942 \text{ km}$$



Úbeda, Spain

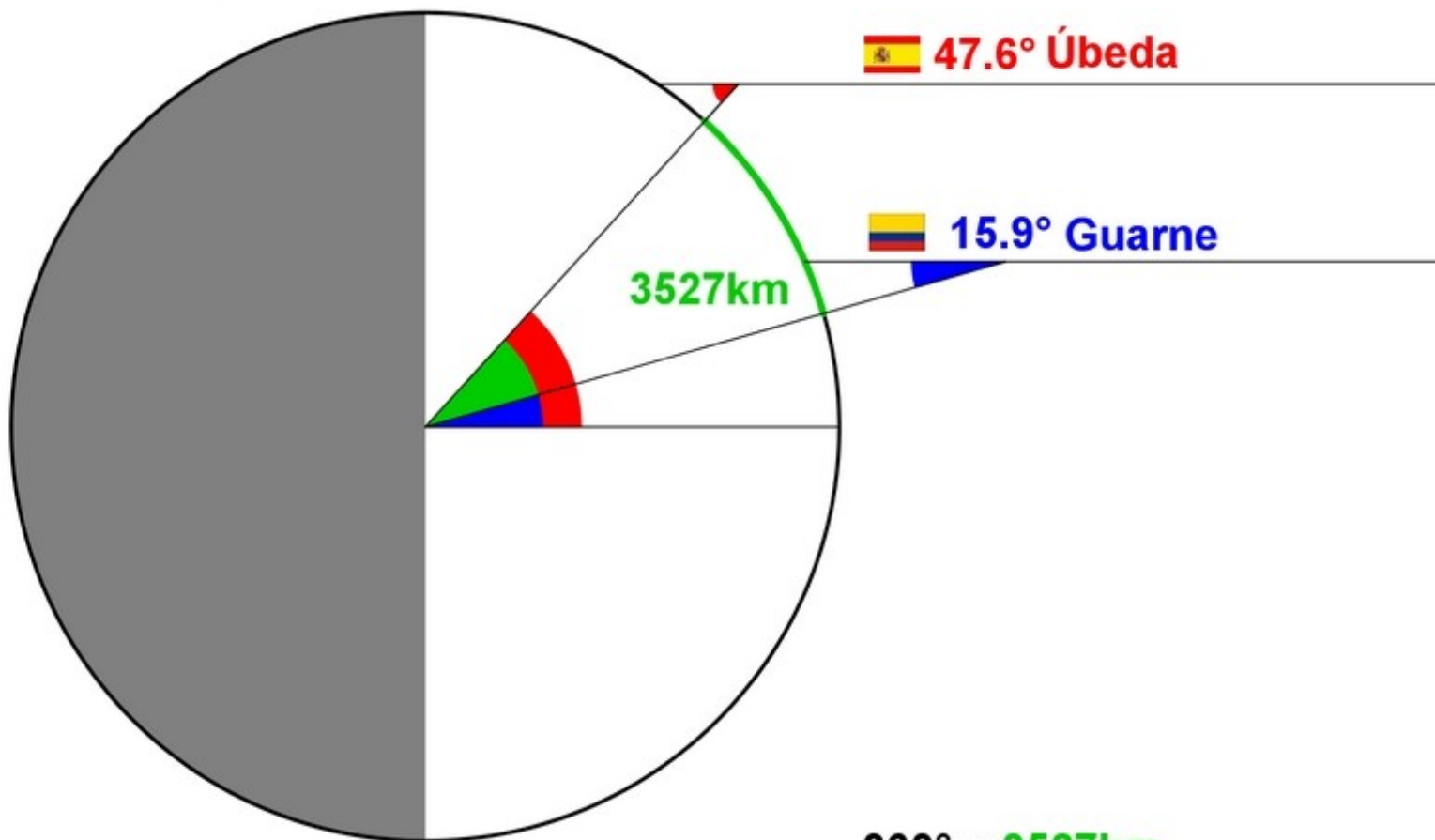


Flag	City	Country	School	Latitude (°) +N/-S	Longitude (°) +E/-W
	Úbeda	Spain	Colegio Salesiano Santo Domingo Savio	38.017	-3.367

Date	Gnomon	Shadow	Angle
18 October 2019	115.2cm	126.2cm	47.6°

18/10/2019 (Úbeda-Spain) Latitude: 38.017°

18/10/2019 (Guarne-Colombia) Latitude: 6.274°



$$\text{circumference} = \frac{360^\circ \times 3527\text{km}}{47.6^\circ - 15.9^\circ} = 40054 \text{ km}$$

Distance	Angle
circumference	360°
3527km	47.6° - 15.9°



Yamunanagar CJC, India

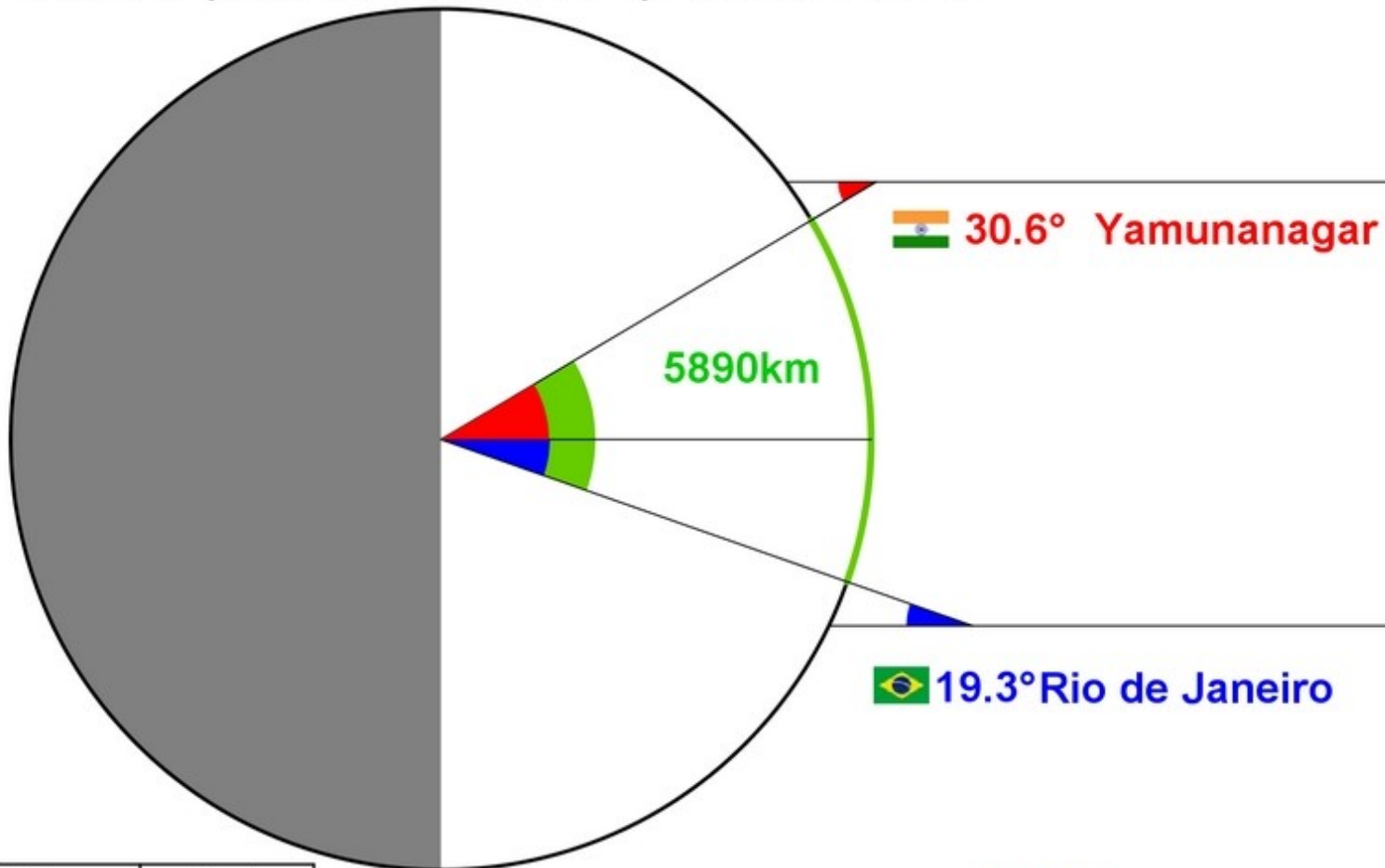


Flag	City	Country	School	Latitude (°) +N/-S	Longitude (°) +E/-W
	Yamunanagar	India	GSSS Camp Jain Colony	30.121	77.263

Date	Gnomon	Shadow	Angle
10 October 2019	49cm	36cm	36.3°

05/10/2019 (Yamunanagar-India) Latitude: 30.121°

04/10/2019 (Rio de Janeiro-Brazil) Latitude: -22.89°



Distance	Angle
circumference	360°
5890km	30.6° + 19.3°

$$\text{circumference} = \frac{360^\circ \times 5890\text{km}}{30.6^\circ + 19.3^\circ} = 42493 \text{ km}$$



Yamunanagar SD, India

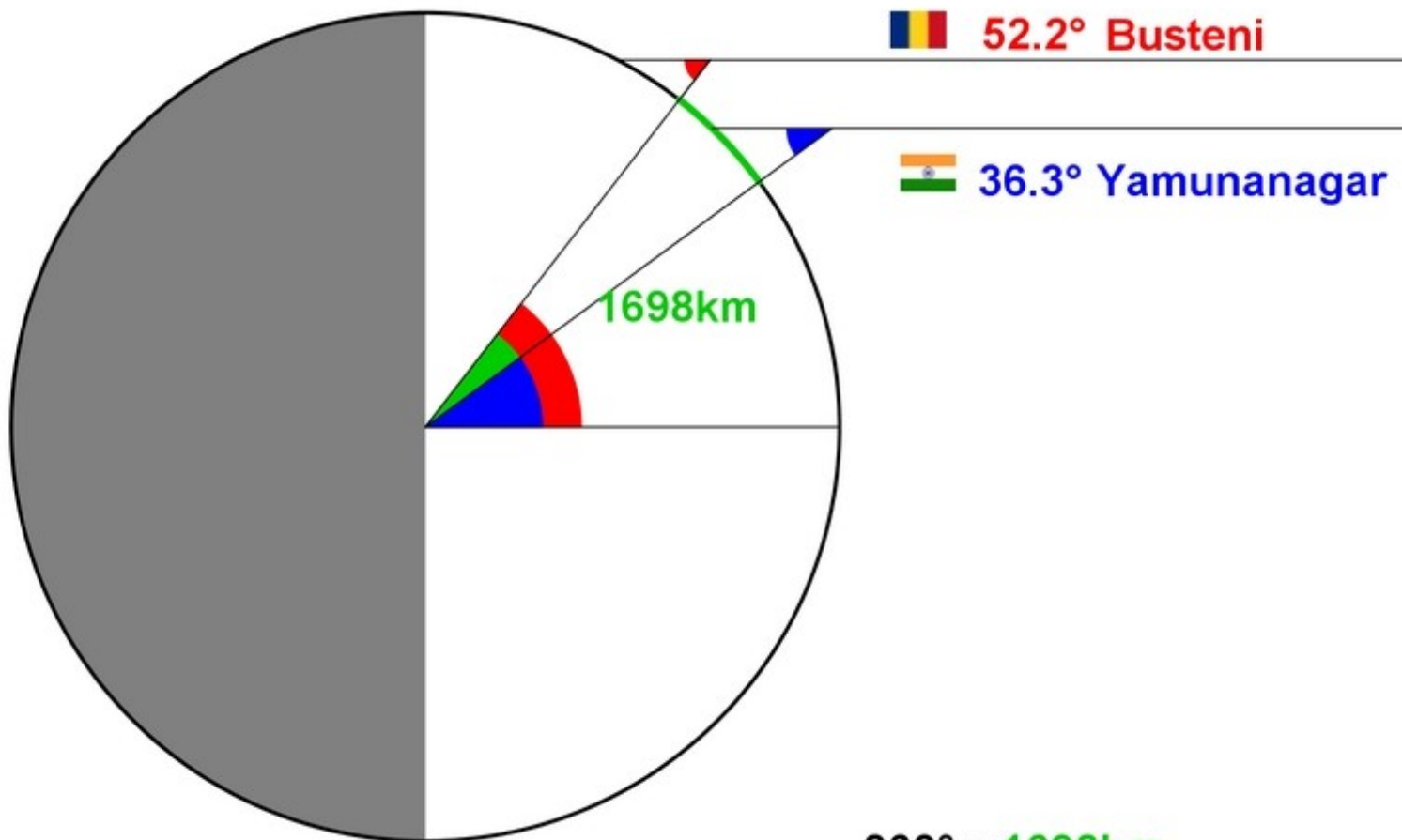


Flag	City	Country	School	Latitude (°) +N/-S	Longitude (°) +E/-W
	Yamunanagar SD	India	Spring Dales Public School	30.133	77.250

Date	Gnomon	Shadow	Angle
05 October 2019	49.0cm	29.0cm	30.6°

10/10/2019 (Busteni-Romania) Latitude: 45.416°

10/10/2019 (Yamunanagar SD-India) Latitude: 30.133°



$$\text{circumference} = \frac{360^\circ \times 1698\text{km}}{52.2^\circ - 36.3^\circ} = 38445 \text{ km}$$

Distance	Angle
circumference	360°
1698km	52.2° - 36.3°



