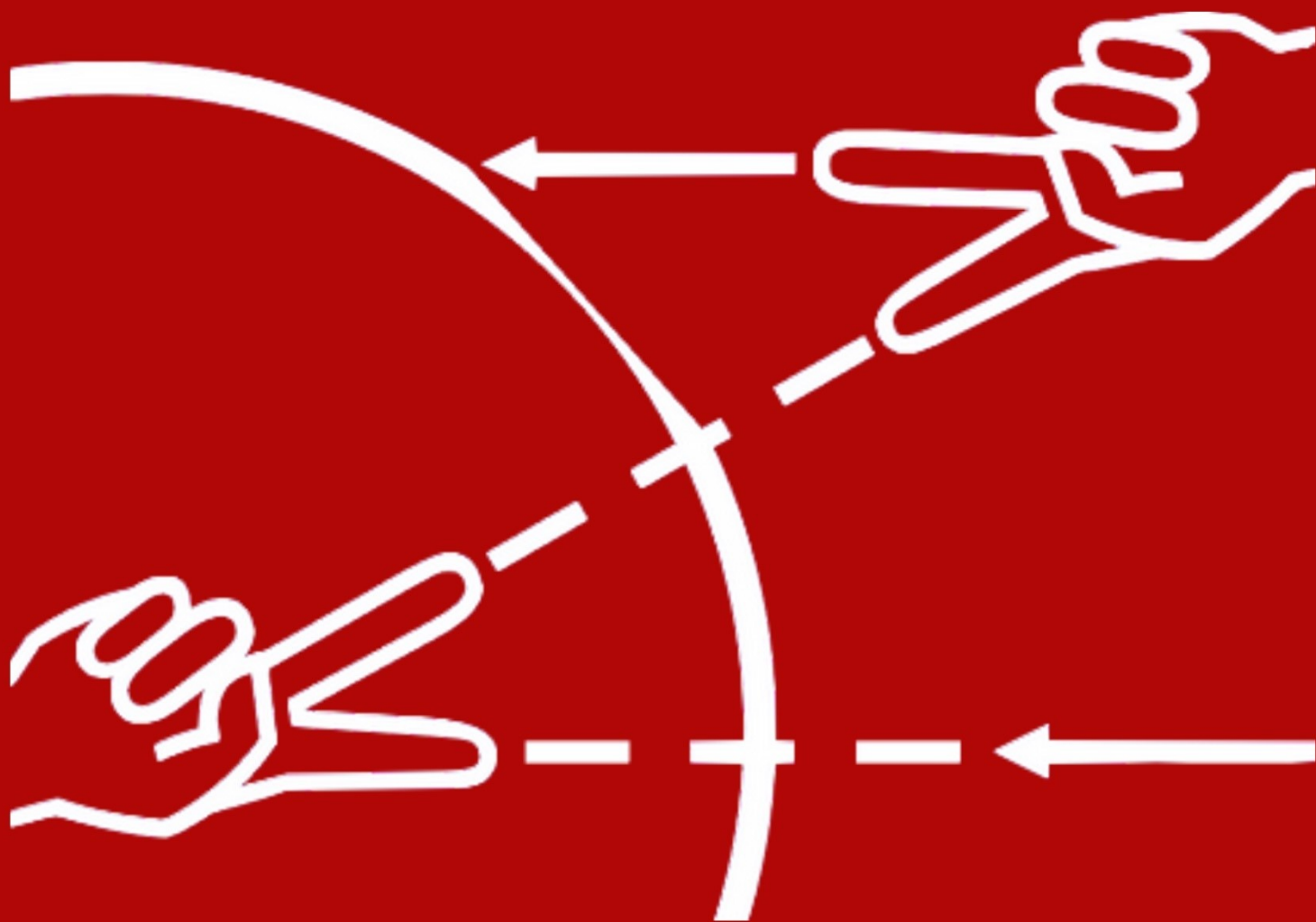


Eratosthenes



3 Continents

7 Countries

11 Schools

64 Measures

3 Continents

7 Countries

11 Schools

64 Measures

BRAZIL (2)

Piranguinho, Rio de Janeiro

CHILE (1)

Santiago

COLOMBIA (1)

Guarne

FRANCE (1)

Lafrançaise

GREECE (4)












Aigio, Athens, Ilion, Petroupoli

PAKISTAN (1)

Jajjah Abbasian


ROMANIA (1)

Busteni

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
	Busteni	Romania	Colegiul Ion Kalinderu	45.416	25.535
	Guarne	Colombia	Grupo Astrofanáticos	6.274	-75.449
	Ilion	Greece	11th JuniorHigh School of Ilion	38.033	23.697
	Jajjah Abbasian	Pakistan	Government Boys Secondary School	28.754	70.569
	Lafrançaise	France	Collège Antonin Perbosc	44.127	1.237
	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
	Santiago	Chile	CARJ-Clube de Astronomia do Rio de Janeiro	-33.417	-70.583

Aigio, Greece

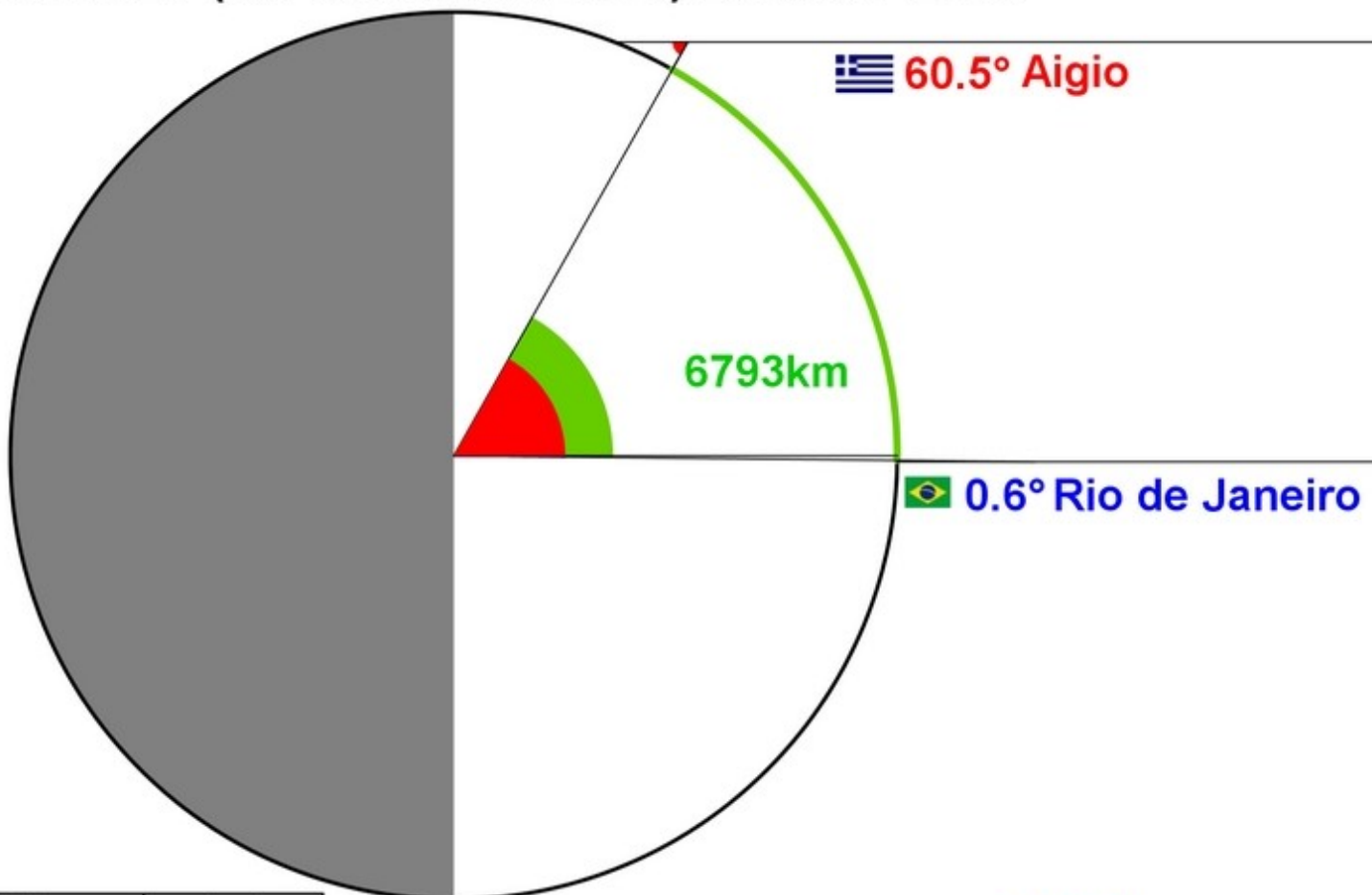


Flag	City	Country	School	Latitude (°) +N/-S	Longitude (°) +E/-W
	Aigio	Greece	1st High School of Aigio	38.252	22.079

Date	Gnomon	Shadow	Angle
08 January 2020	30.0cm	53.0cm	60.5°
13 January 2020	30cm	41cm	53.8°
16 January 2020	30.0cm	50.3cm	59.2°
20 January 2020	30cm	49cm	58.5°
24 January 2020	30.0cm	46.9cm	57.4°

08/01/2020 (Aigio-Greece) Latitude: 38.252°

08/01/2020 (Rio de Janeiro-Brazil) Latitude: -22.89°



Distance	Angle
circumference	360°
6793km	60.5°+0.6°

$$\text{circumference} = \frac{360^\circ \times 6793\text{km}}{60.5^\circ + 0.6^\circ} = 40024 \text{ km}$$



Athens, Greece

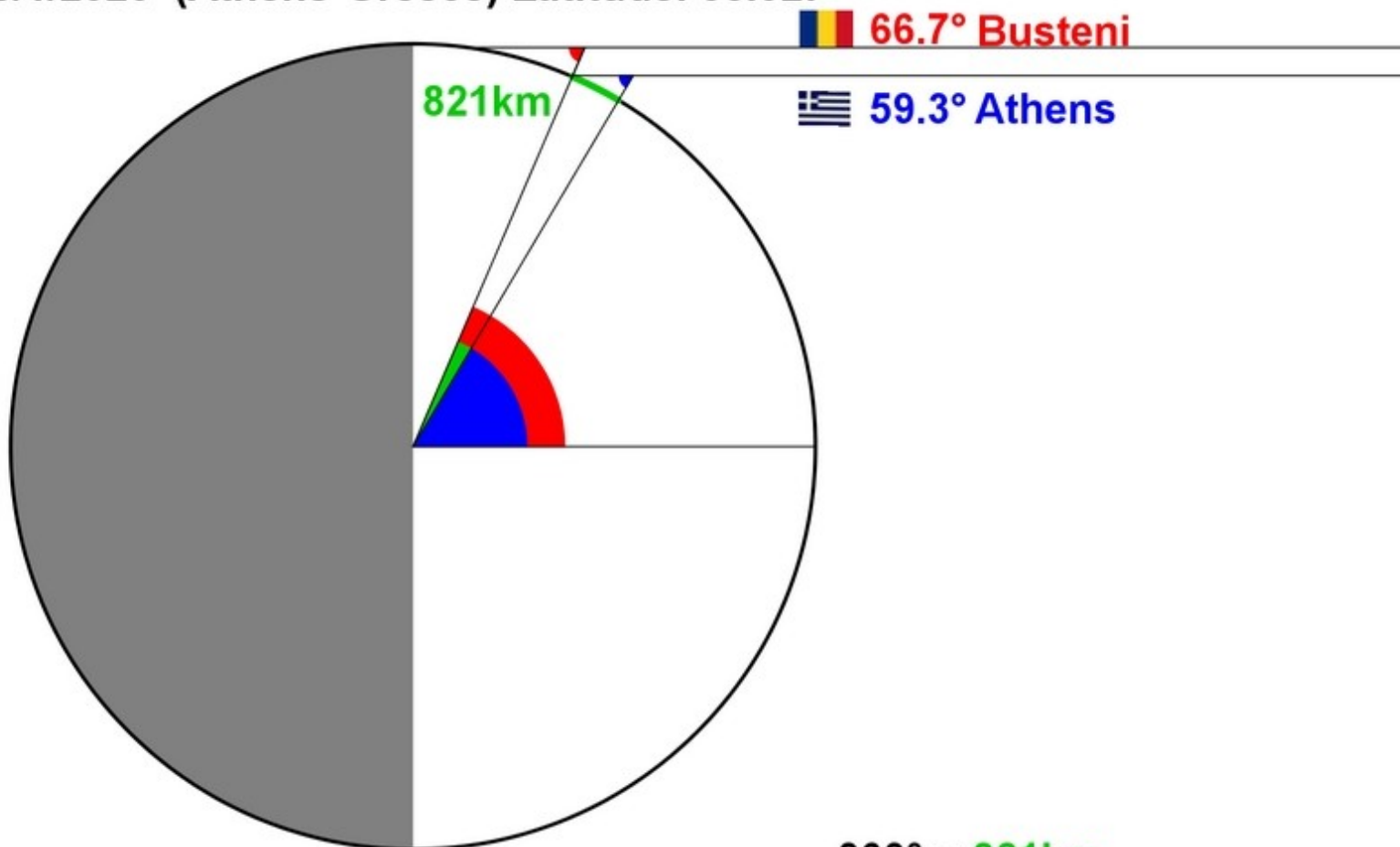


Flag	City	Country	School	Latitude (°) +N/-S	Longitude (°) +E/-W
	Athens	Greece	Experimental College Agion Anargyron	38.027	23.726

Date	Gnomon	Shadow	Angle
13 January 2020	49cm	82.5cm	59.3°

13/1/2020 (Busteni-Romania) Latitude: 45.416°

13/1/2020 (Athens-Greece) Latitude: 38.027°




$$\text{circumference} = \frac{360^\circ \times 821\text{km}}{66.7^\circ - 59.3^\circ} = 39941 \text{ km}$$

Distance	Angle
circumference	360°
821km	66.7° - 59.3°



Busteni, Romania

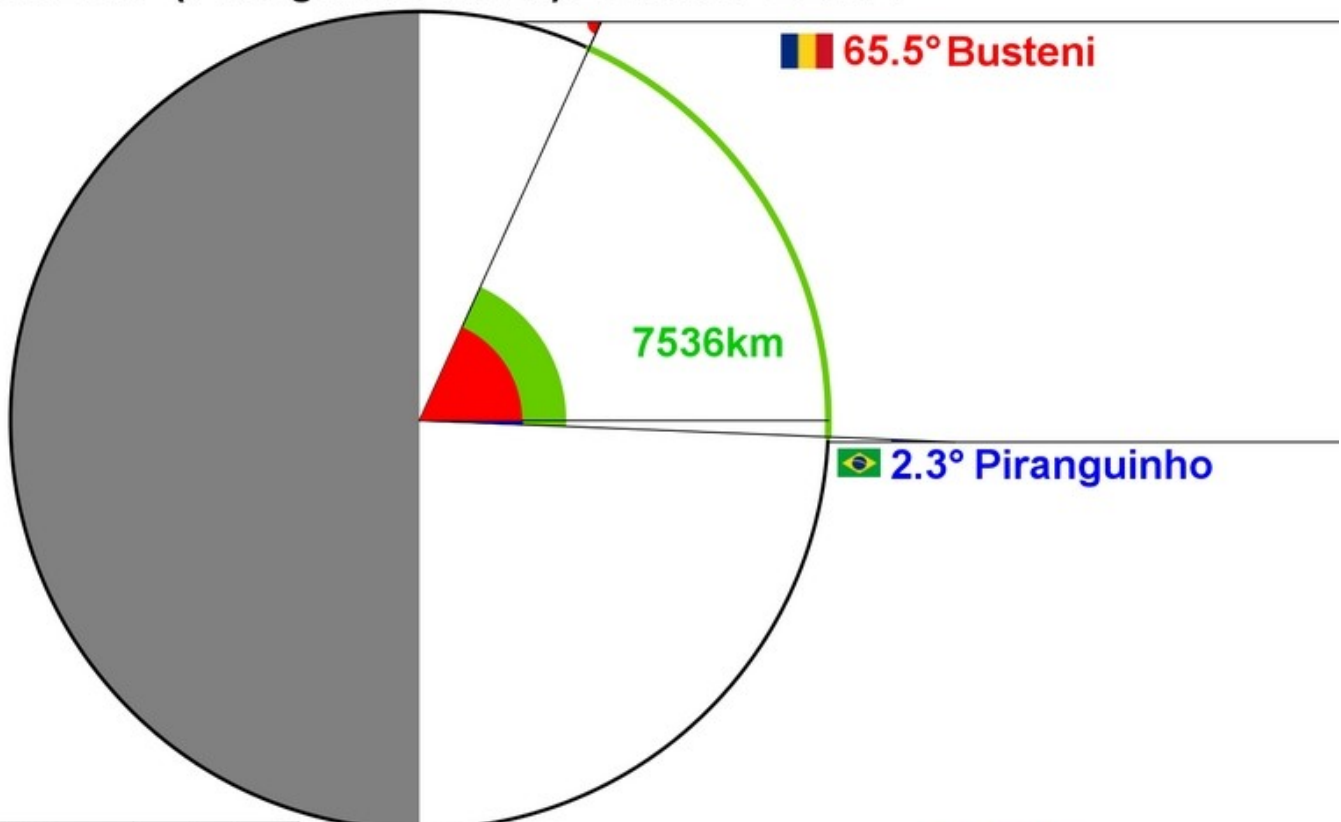


Flag	City	Country	School	Latitude (°) +N/-S	Longitude (°) +E/-W
	Busteni	Romania	Colegiul Ion Kalinderu	45.416	25.535

Date	Gnomon	Shadow	Angle
13 January 2020	100cm	232.6cm	66.7°
14 January 2020	10.8cm	25cm	66.6°
15 January 2020	10.9cm	25.0cm	66.4°
16 January 2020	100.0cm	226.8cm	66.2°
17 January 2020	100.0cm	224.8cm	66.0°
20 January 2020	50cm	109.5cm	65.5°
21 January 2020	38.3cm	83.0cm	65.2°
22 January 2020	39.2cm	84.0cm	65.0°
23 January 2020	50.4cm	107.0cm	64.8°
24 January 2020	100.0cm	209.9cm	64.5°
27 January 2020	50.0cm	101.9cm	63.9°
28 January 2020	50.0cm	100.8cm	63.6°
29 January 2020	50.0cm	99.6cm	63.3°
30 January 2020	50.0cm	98.5cm	63.1°
31 January 2020	50.0cm	97.4cm	62.8°

20/1/2020 (Busteni-Romania) Latitude: 45.416°

20/1/2020 (Piranguinho-Brazil) Latitude: -22.411°



Distance	Angle
circumference	360°
7536km	65.5°+2.3°

$$\text{circumference} = \frac{360^\circ \times 7536\text{km}}{65.5^\circ + 2.3^\circ} = 40014 \text{ km}$$



Guarne, Colombia

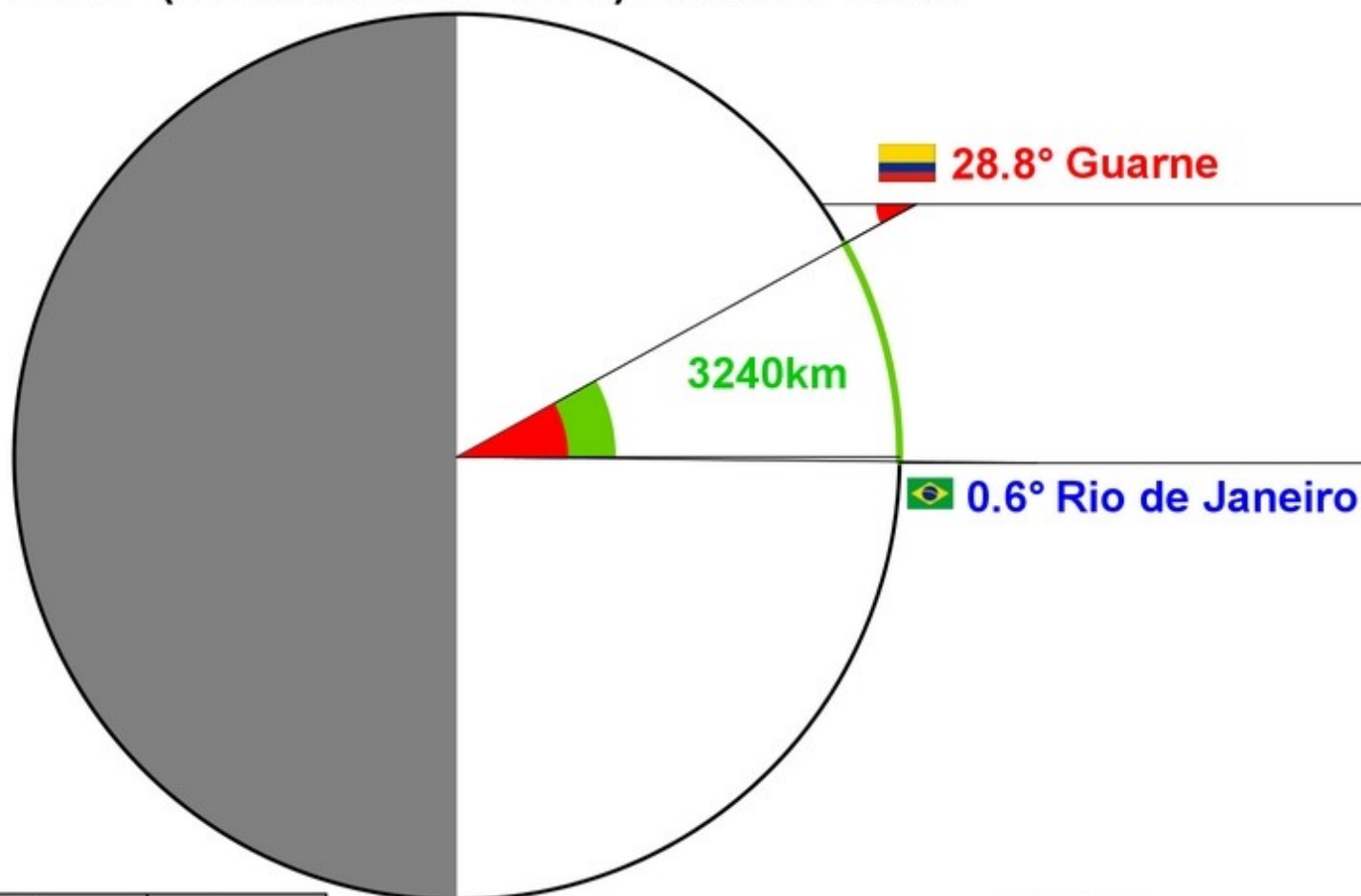


Flag	City	Country	School	Latitude (°) +N/-S	Longitude (°) +E/-W
	Guarne	Colombia	Grupo Astrofanáticos	6.274	-75.449

Date	Gnomon	Shadow	Angle
01 January 2020	30.5cm	17.3cm	29.6°
09 January 2020	30.5cm	16.8cm	28.8°
17 January 2020	30.5cm	16cm	27.7°

9/1/2020 (Guarne-Colombia) Latitude: 6.274°

9/1/2020 (Rio de Janeiro-Brazil) Latitude: -22.89°



Distance	Angle
circumference	360°
3240km	28.8° + 0.6°

$$\text{circumference} = \frac{360^\circ \times 3240\text{km}}{28.8^\circ + 0.6^\circ} = 39673 \text{ km}$$



Ilion, Greece

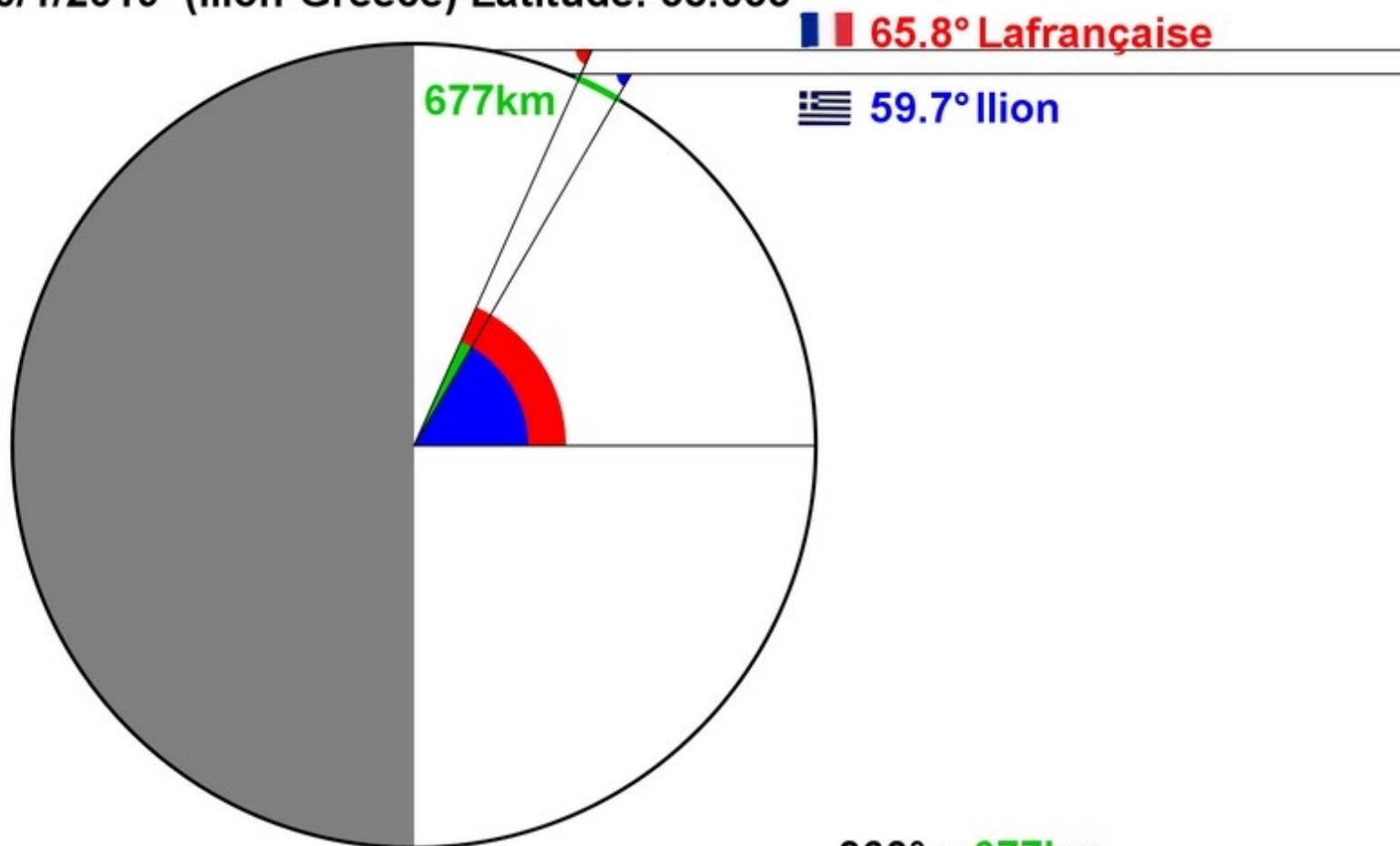


Flag	City	Country	School	Latitude (°) +N/-S	Longitude (°) +E/-W
	Ilion	Greece	11th JuniorHigh School of Ilion	38.033	23.697

Date	Gnomon	Shadow	Angle
10 January 2020	30.0cm	51.3cm	59.7°
24 January 2020	60.0cm	93.5cm	57.3°
31 January 2020	60.0cm	87.3cm	55.5°

10/1/2020 (Lafrançaise-France) Latitude: 44.127°

10/1/2019 (Ilion-Greece) Latitude: 38.033°



$$\text{circumference} = \frac{360^\circ \times 677\text{km}}{65.8^\circ - 59.7^\circ} = 39954 \text{ km}$$

Distance	Angle
circumference	360°
677km	65.8° - 59.7°



Jajjah Abbasian, Pakistan



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

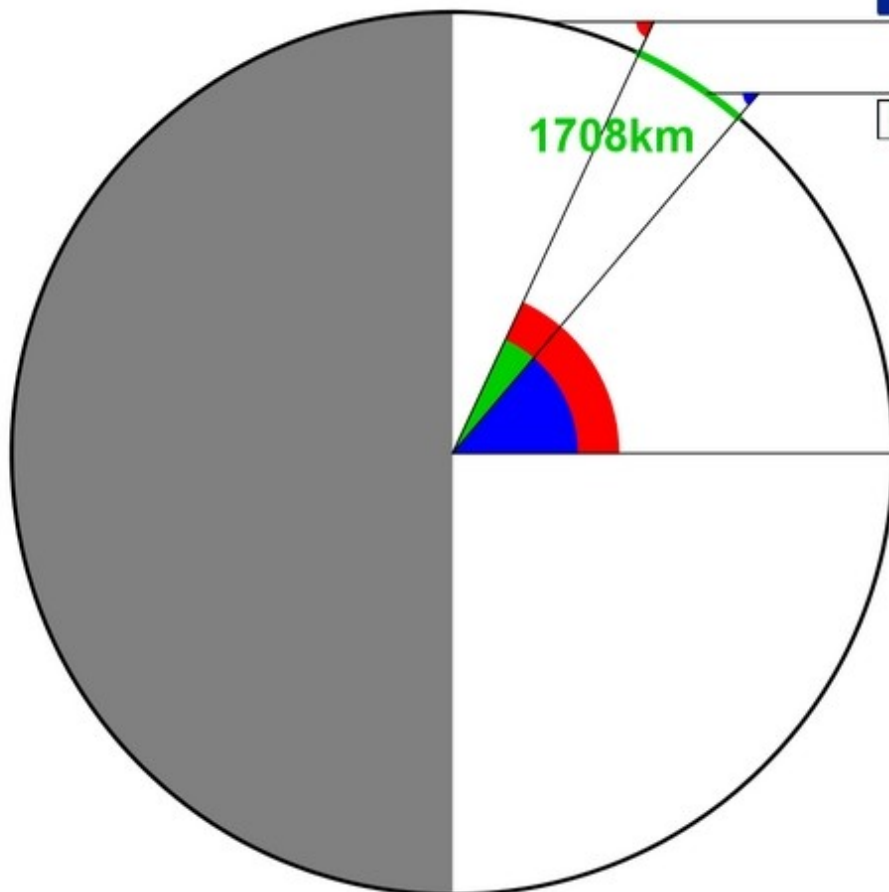
Date	Gnomon	Shadow	Angle
16 January 2020	100cm	117.3cm	49.6°
21 January 2020	100.0cm	113.2cm	48.5°
28 January 2020	100.0cm	107.1cm	47.0°

16/1/2020 (Lafrançaise-France) Latitude: 44.127°

16/1/2020 (Jajjah Abbasian-Pakistan) Latitude: 28.754°

65° Lafrançaise

49.6° Jajjah Abbasian



$$\text{circumference} = \frac{360^\circ \times 1708\text{km}}{65^\circ - 49.6^\circ} = 39927 \text{ km}$$

Distance	Angle
circumference	360°
1708km	65° - 49.6°



Lafrançaise, France



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

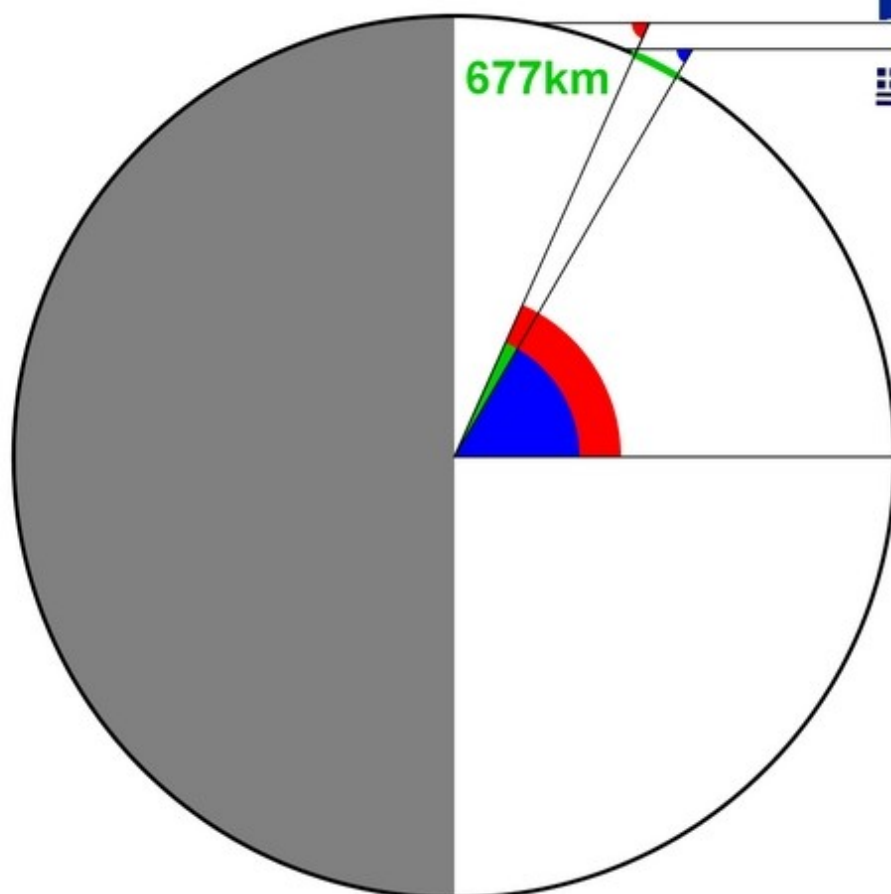
Date	Gnomon	Shadow	Angle
06 January 2020	100.0cm	230.0cm	66.5°
10 January 2020	100.0cm	223.0cm	65.8°
16 January 2020	100.0cm	214.0cm	65.0°
17 January 2020	100cm	208cm	64.3°
20 January 2020	100.0cm	206.0cm	64.1°
24 January 2020	100.0cm	199.0cm	63.3°
31 January 2020	100.0cm	185.0cm	61.6°

10/1/2020 (Lafrançaise-France) Latitude: 44.127°

10/1/2019 (Ilion-Greece) Latitude: 38.033°

 **65.8° Lafrançaise**

 **59.7° Ilion**



$$\text{circumference} = \frac{360^\circ \times 677\text{km}}{65.8^\circ - 59.7^\circ} = 39954 \text{ km}$$

Distance	Angle
circumference	360°
677km	65.8° - 59.7°



Petroupoli, Greece

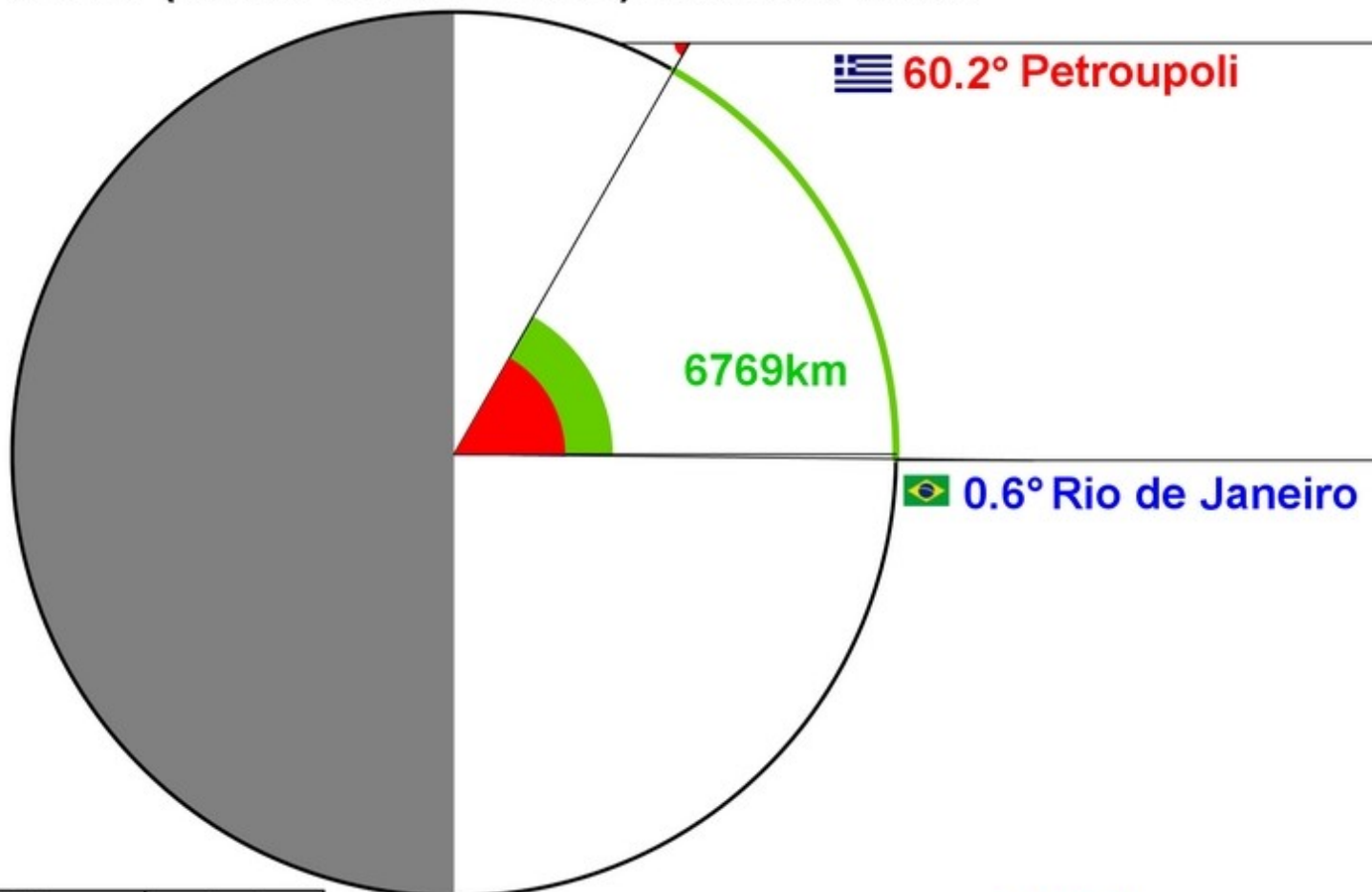


Flag	City	Country	School	Latitude (°) +N/-S	Longitude (°) +E/-W
	Petroupoli	Greece	4o Junior High School	38.036	23.674

Date	Gnomon	Shadow	Angle
09 January 2020	59.5cm	103.8cm	60.2°
23 January 2020	59.5cm	92.3cm	57.2°
30 January 2020	59.5cm	87.2cm	55.7°

9/1/2020 (Petroupoli-Greece) Latitude: 38.036°

9/1/2020 (Rio de Janeiro-Brazil) Latitude: -22.89°



Distance	Angle
circumference	360°
6769km	60.2°+0.6°

$$\text{circumference} = \frac{360^\circ \times 6769\text{km}}{60.2^\circ + 0.6^\circ} = 40080 \text{ km}$$



Piranguinho, Brazil

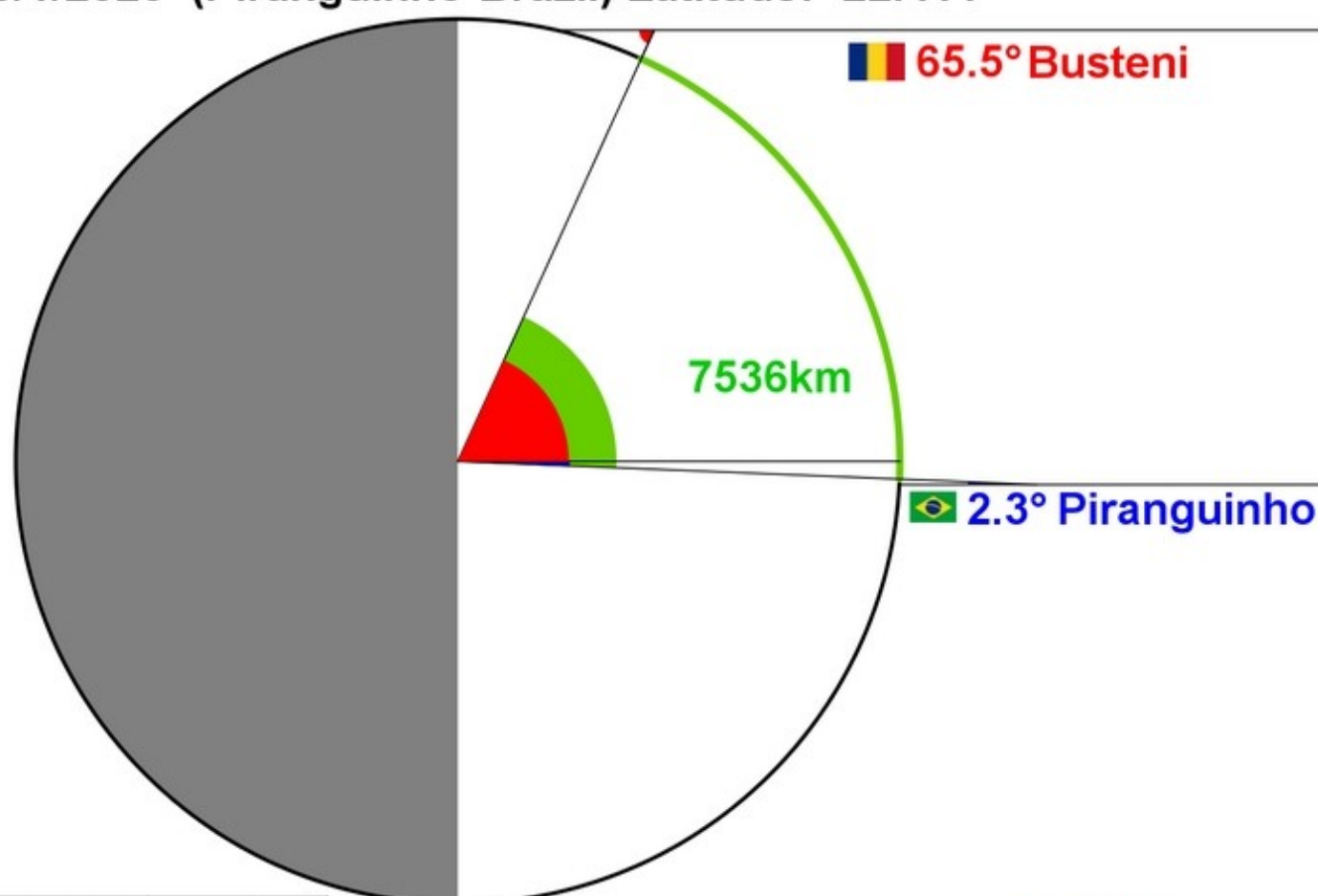


Flag	City	Country	School	Latitude (°) +N/-S	Longitude (°) +E/-W
	Piranguinho	Brazil	Universidade Federal de Itajubá	-22.411	-45.535

Date	Gnomon	Shadow	Angle
07 January 2020	243.0cm	0.0cm	0.0°
10 January 2020	70cm	-0.7cm	-0.6°
15 January 2020	70.0cm	-1.4cm	-1.1°
20 January 2020	70cm	-2.8cm	-2.3°
21 January 2020	70.0cm	-2.9cm	-2.4°
27 January 2020	70.0cm	-4.7cm	-3.8°
31 January 2020	70.0cm	-6.2cm	-5.1°

20/1/2020 (Busteni-Romania) Latitude: 45.416°

20/1/2020 (Piranguinho-Brazil) Latitude: -22.411°



Distance	Angle
circumference	360°
7536km	65.5° + 2.3°

$$\text{circumference} = \frac{360^\circ \times 7536\text{km}}{65.5^\circ + 2.3^\circ} = 40014 \text{ km}$$

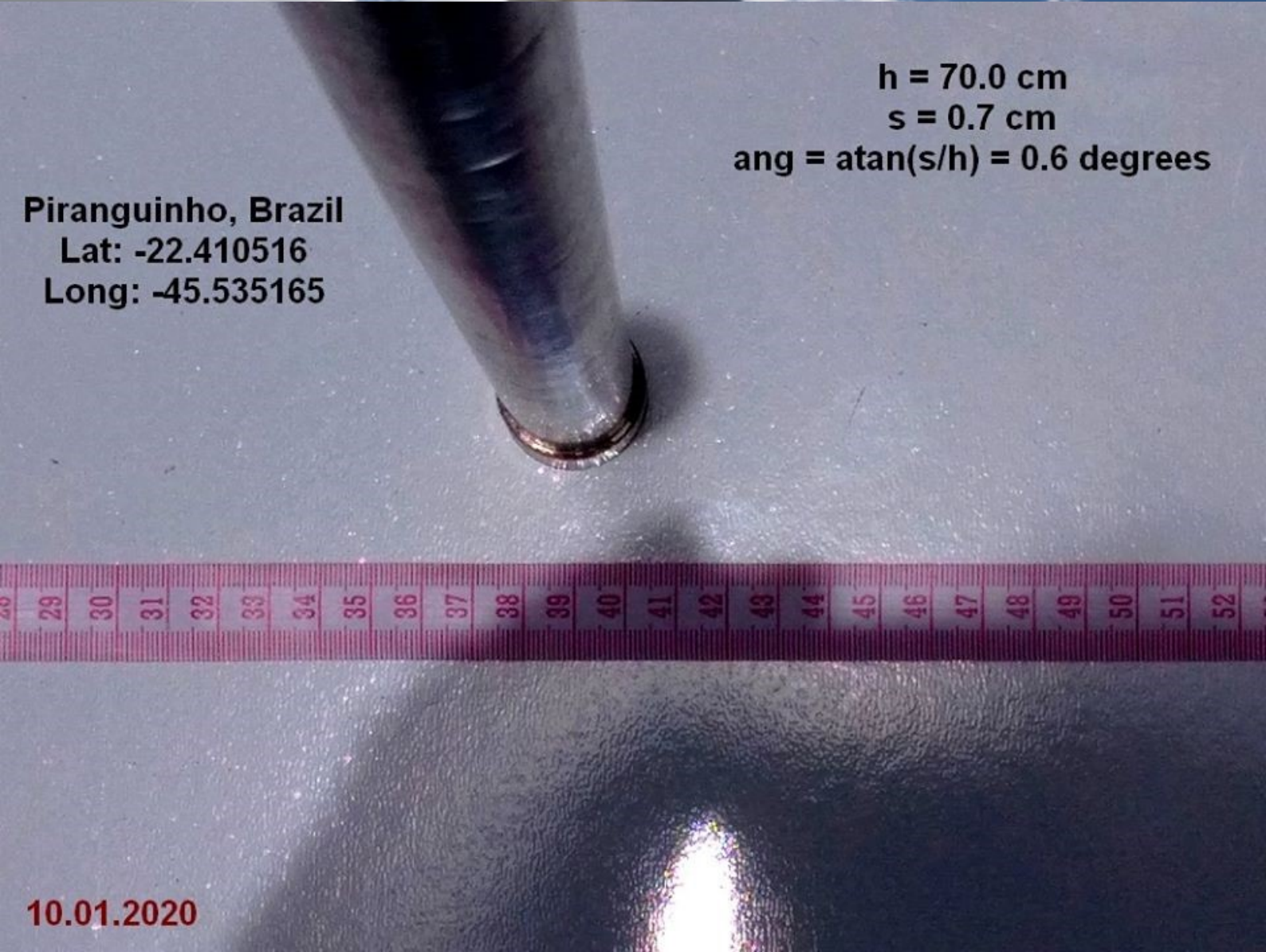
The Sun at zenith!!!

07.01.2020



$h = 70.0 \text{ cm}$
 $s = 0.7 \text{ cm}$
 $\text{ang} = \text{atan}(s/h) = 0.6 \text{ degrees}$


Piranguinho, Brazil
Lat: -22.410516
Long: -45.535165



10.01.2020

Rio de Janeiro CENOM, Brazil

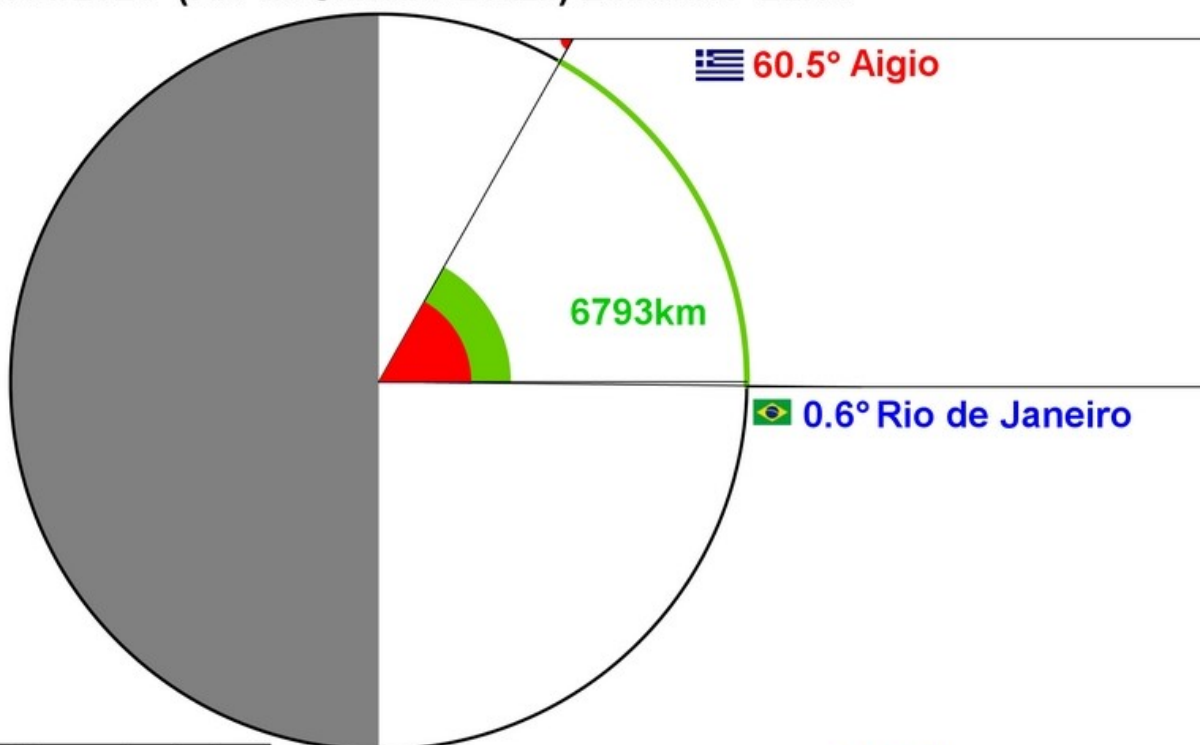


Flag	City	Country	School	Latitude (°) +N/-S	Longitude (°) +E/-W
	Rio de Janeiro	Brazil	Centro Educacional Nosso Mundo	-22.890	-43.317

Date	Gnomon	Shadow	Angle
06 January 2020	20.0cm	1.0cm	2.9°
07 January 2020	20.0cm	0.0cm	0.0°
08 January 2020	20.0cm	-0.2cm	-0.6°
09 January 2020	20.0cm	-0.2cm	-0.6°
10 January 2020	20.0cm	-0.2cm	-0.6°
14 January 2020	20cm	0cm	0°
15 January 2020	20cm	0cm	0°
16 January 2020	20.0cm	0.0cm	0.0°
21 January 2020	20.0cm	-0.1cm	-0.3°
22 January 2020	20.0cm	-0.2cm	-0.6°
24 January 2020	20.0cm	-0.2cm	-0.6°
27 January 2020	20.0cm	-1.5cm	-4.3°
28 January 2020	20.0cm	-1.5cm	-4.3°
29 January 2020	20.0cm	-1.5cm	-4.3°
30 January 2020	20.0cm	-1.5cm	-4.3°
31 January 2020	20.0cm	-1.2cm	-3.4°

08/01/2020 (Aigio-Greece) Latitude: 38.252°

08/01/2020 (Rio de Janeiro-Brazil) Latitude: -22.89°




Distance	Angle
circumference	360°
6793km	60.5°+0.6°

$$\text{circumference} = \frac{360^\circ \times 6793\text{km}}{60.5^\circ + 0.6^\circ} = 40024 \text{ km}$$



Santiago, Chile

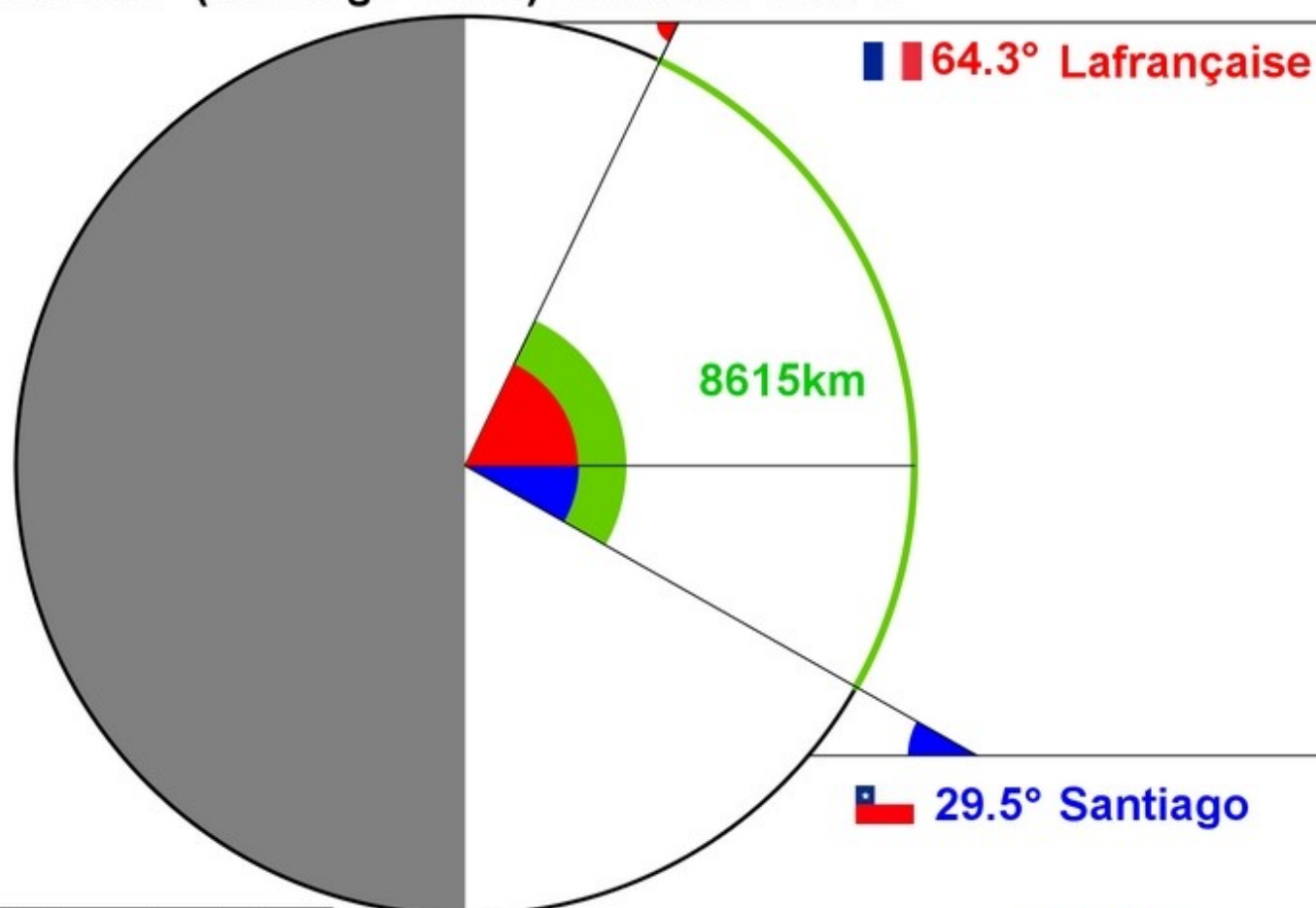


Flag	City	Country	School	Latitude (°) +N/-S	Longitude (°) +E/-W
	Santiago	Chile	CARJ-Clube de Astronomia do Rio de Janeiro	-33.417	-70.583

Date	Gnomon	Shadow	Angle
17 January 2020	95.5cm	-54.0cm	-29.5°

17/1/2020 (Lafrançaise-France) Latitude: 44.127°

17/1/2020 (Santiago-Chile) Latitude: -33.417°



Distance	Angle
circumference	360°
8615km	64.3° + 29.5°

$$\text{circumference} = \frac{360^\circ \times 8615\text{km}}{64.3^\circ + 29.5^\circ} = 33064 \text{ km}$$



