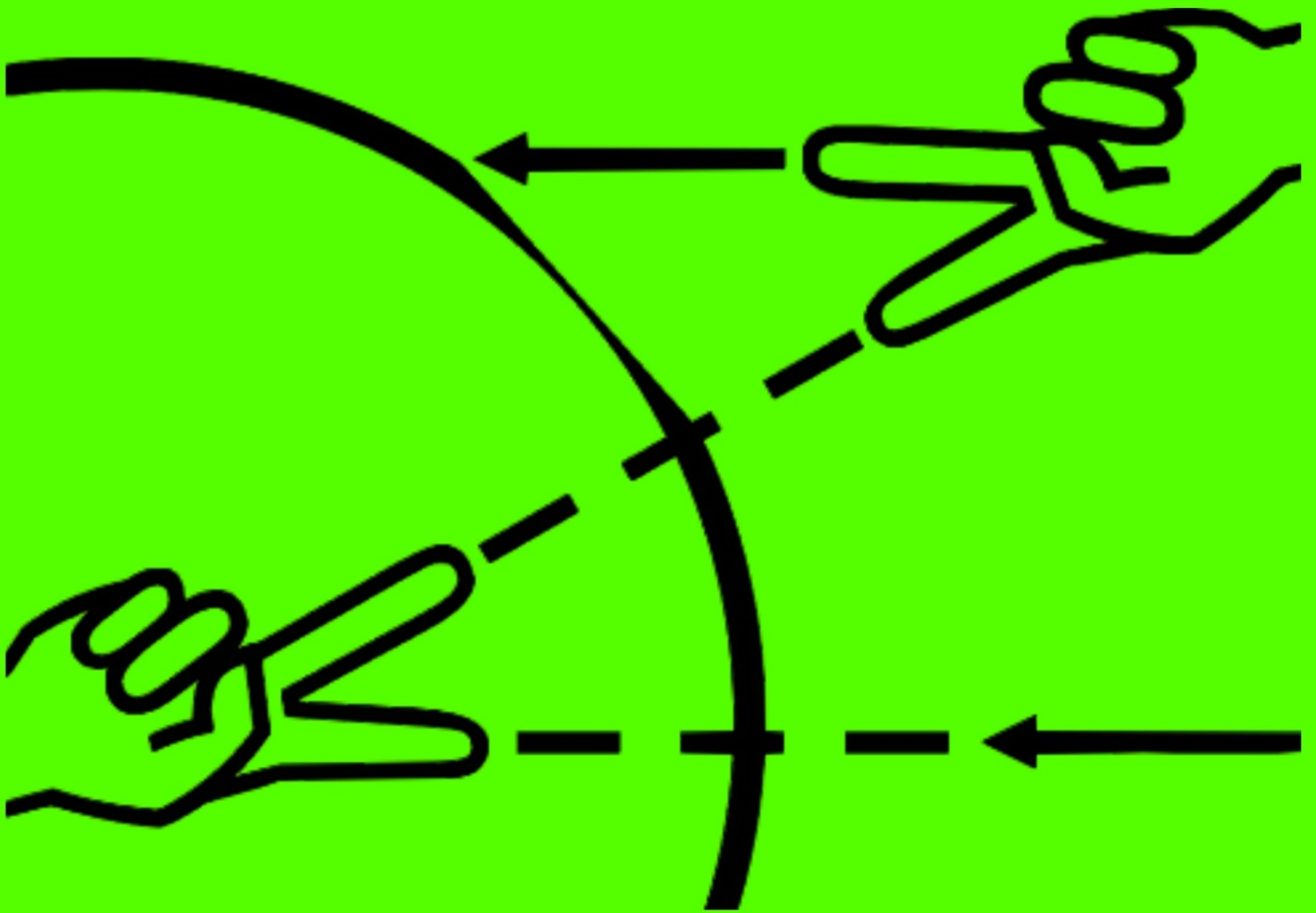


# Eratosthenes



**4** Continents

**11** Countries

**25** Schools

**87** Measures

**4** Continents

**11** Countries

**25** Schools

**87** Measures

ARGENTINA (1)

Chivilcoy

BRAZIL (5)

Andarai, Itajubá, Piranguinho, Rio de Janeiro (2)

COLOMBIA (1)

Guarne

EGYPT (7)

Alexandria, Port Said, Mansourah, El Senbellawein  
Al Minya, Sohag, Aswan / Kom Ombo

FRANCE (1)

Lafrançaise

GREECE (3)

Aigio, Chalkida, Petropouli

INDIA (1)

Yamunanagar

MALAYSIA (1)

Cameron Highlands

ROMANIA (2)

Busteni, Mărgineni

SPAIN (1)

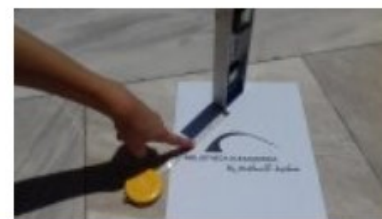
Úbeda

TUNISIA (2)

Bizerte, Mohammedia

Flag	City	Country	School	Latitude (°) +N/-S	Longitude (°) +E/-W
	Aigio	Greece	1st High School of Aigio	38.252	22.079
	Al Minya	Egypt		28.089	30.759
	Alexandria	Egypt	Bibliotheca Alexandrina	31.209	29.909
	Andaraí	Brazil	Clube de Astronomia do Rio de Janeiro	-22.928	-43.258
	Aswan / Kom Ombo	Egypt		24.091	32.899
	Bizerte	Tunisia	Ecole Primaire Raouabi	37.284	9.868
	Busteni	Romania	Colegiul Ion Kalinderu	45.416	25.535
	Cameron Highlands	Malaysia	SMK Kampung Raja	4.564	101.408
	Chalkida	Greece	29th Kindergarten of Chalkida	38.469	23.580
	Chivilcoy	Argentina	Parque Cielos del Sur	-34.911	-60.014
	El Senbellawein	Egypt		30.891	31.455
	Guarne	Colombia	Grupo Astrofanáticos	6.274	-75.449
	Itajubá	Brazil	Universidade Federal de Itajubá	-22.415	-45.449
	Lafrançaise	France	Collège Antonin Perbosc	44.127	1.237
	Mansourah	Egypt		31.038	31.382
	Mărgineni	Romania	Gh. Popescu School	44.533	24.554
	Mohammedia	Tunisia	Lycée M'hamdia	36.678	10.152
	Petroupoli	Greece	4o Junior High School	38.036	23.674
	Piranguinho	Brazil	Universidade Federal de Itajubá	-22.411	-45.535
	Port Said	Egypt		31.265	32.302
	Rio de Janeiro	Brazil	Centro Educacional Nosso Mundo	-22.890	-43.317
	Rio de Janeiro	Brazil	Prefeitura	-22.911	-43.206
	Sohag	Egypt		26.559	31.696
	Úbeda	Spain	Colegio Salesiano Santo Domingo Savio	38.017	-3.367
	Yamunanagar	India	C V Raman Science Club	30.133	77.283

# Aigio, Greece

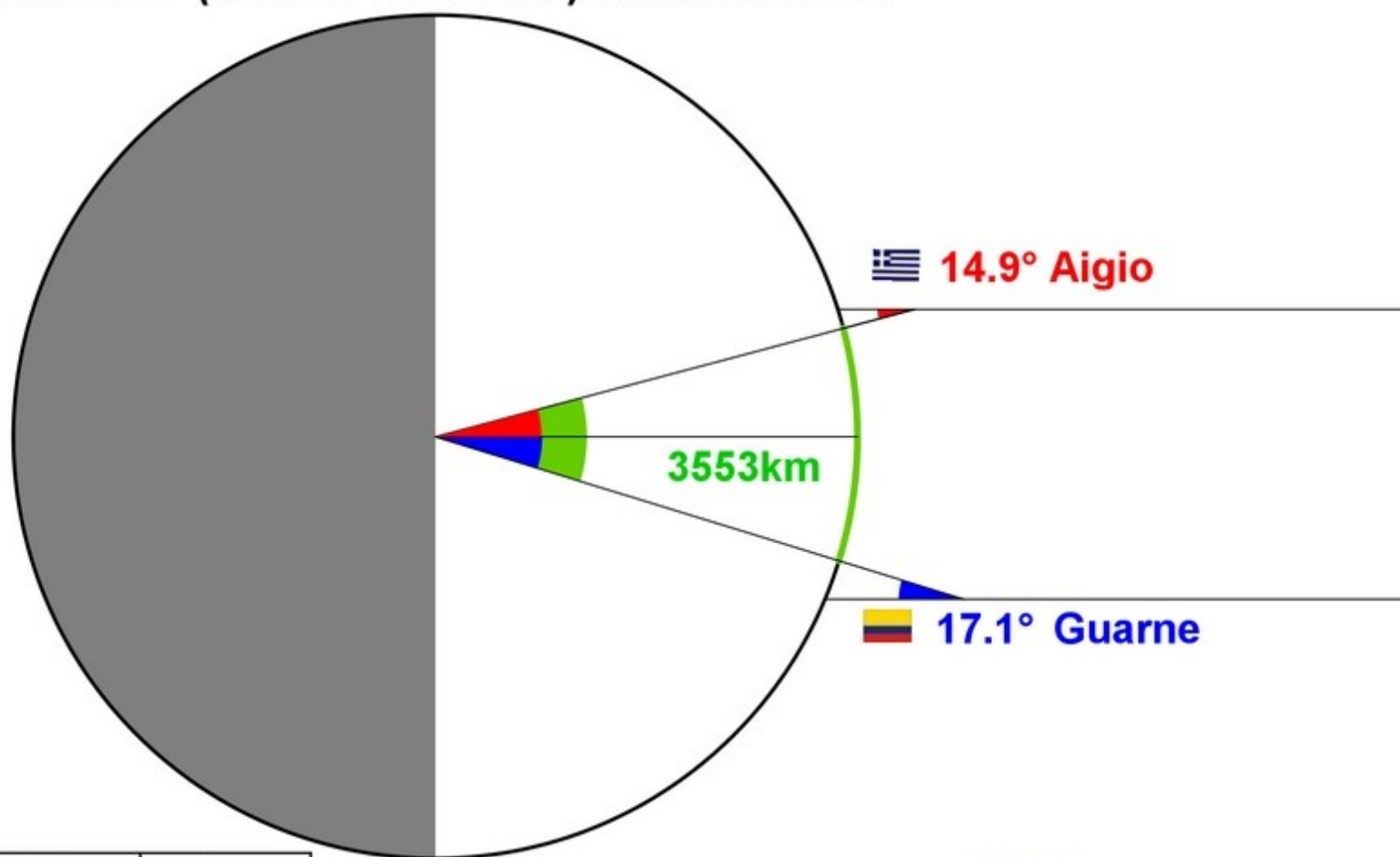


Flag	City	Country	School	Latitude (°) +N/-S	Longitude (°) +E/-W
	Aigio	Greece	1st High School of Aigio	38.252	22.079

Date	Gnomon	Shadow	Angle
10 June 2019	30cm	8cm	14.9°
18 June 2019	30.0cm	8.0cm	14.9°
20 June 2019	40.0cm	10.5cm	14.7°

18/06/2019 (Aigio-Greece) Latitude: 38.252°

18/06/2019 (Guarne-Colombia) Latitude: 6.274°



Distance	Angle
circumference	360°
3553km	14.9° + 17.1°

$$\text{circumference} = \frac{360^\circ \times 3553\text{km}}{14.9^\circ + 17.1^\circ} = 39971 \text{ km}$$





# Al Minya, Egypt

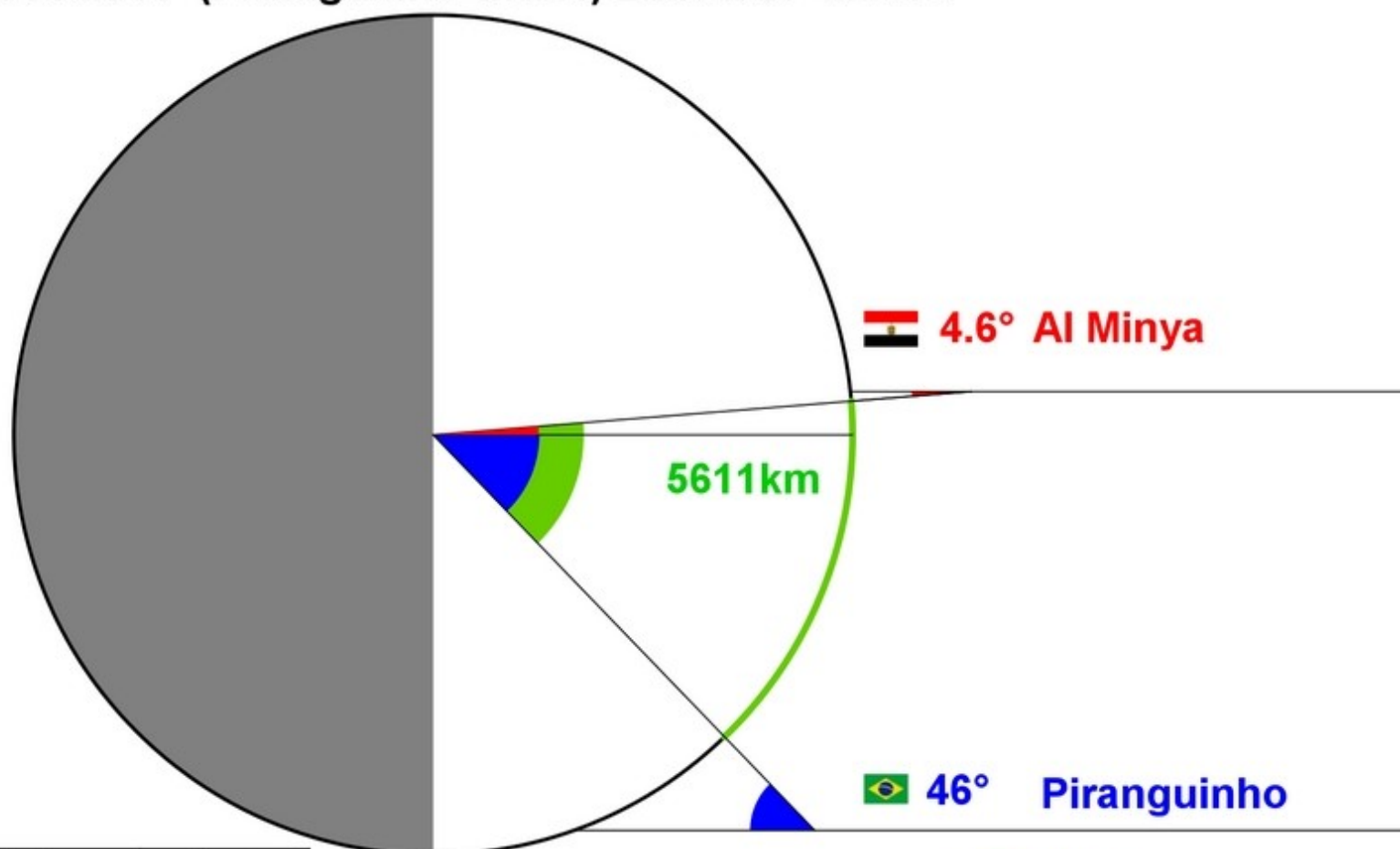


Flag	City	Country	School	Latitude (°) +N/-S	Longitude (°) +E/-W
	Al Minya	Egypt		28.089	30.759

Date	Gnomon	Shadow	Angle
22 June 2019	100.0cm	8.0cm	4.6°

**22/06/2019 (Al Minya-Egypt) Latitude: 28.089°**

**22/06/2019 (Piranguinho-Brazil) Latitude: -22.411°**



$$\text{circumference} = \frac{360^\circ \times 5611\text{km}}{4.6^\circ + 46^\circ} = 39920 \text{ km}$$


Distance	Angle
circumference	360°
5611km	4.6° + 46°





# Alexandria, Egypt

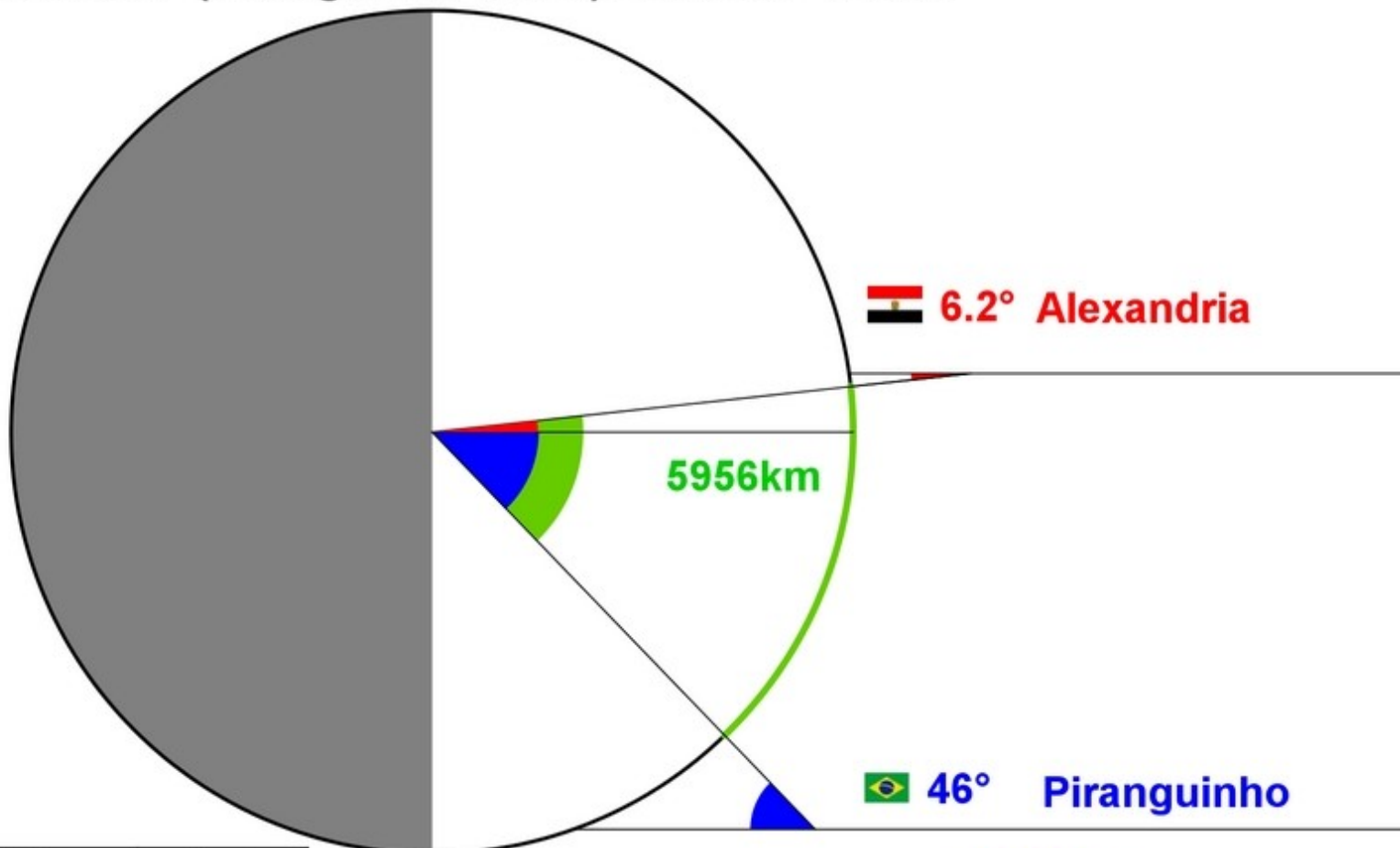


Flag	City	Country	School	Latitude (°) +N/-S	Longitude (°) +E/-W
	Alexandria	Egypt	Bibliotheca Alexandrina	31.209	29.909

Date	Gnomon	Shadow	Angle
22 June 2019	27.5cm	3cm	6.2°

22/06/2019 (Alexandria-Egypt) Latitude: 31.2°

22/06/2019 (Piranguinho-Brazil) Latitude: -22.411°



 6.2° Alexandria

 46° Piranguinho

$$\text{circumference} = \frac{360^\circ \times 5956\text{km}}{6.2^\circ + 46^\circ} = 41076 \text{ km}$$

Distance	Angle
circumference	360°
5956km	6.2° + 46°





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# Andaraí, Brazil

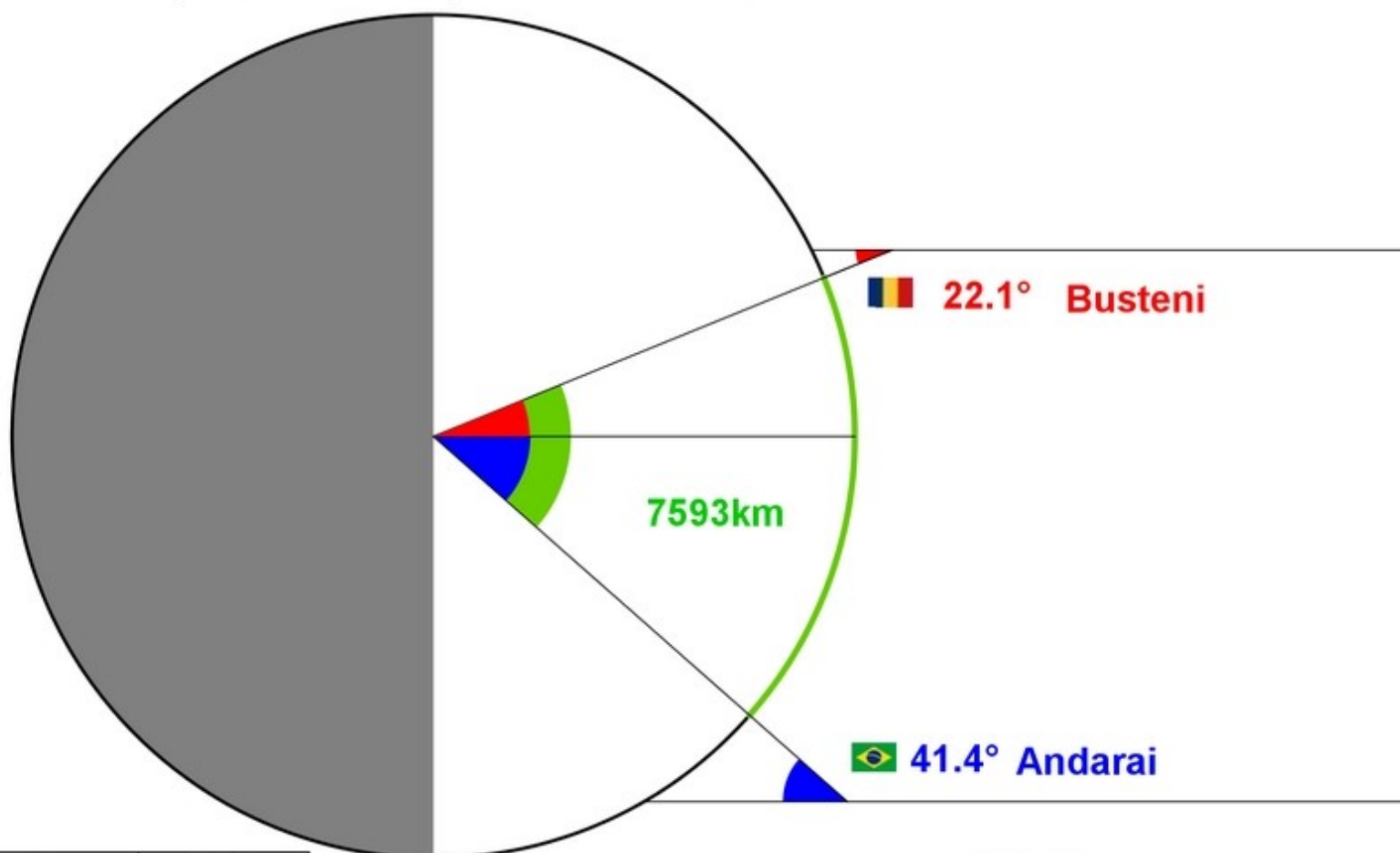


Flag	City	Country	School	Latitude (°) +N/-S	Longitude (°) +E/-W
	Andaraí	Brazil	Clube de Astronomia do Rio de Janeiro	-22.928	-43.258

Date	Gnomon	Shadow	Angle
23 June 2019	21.8cm	-18.9cm	-40.9°
24 June 2019	21.8cm	-18.9cm	-40.9°
26 June 2019	21.8cm	-19.2cm	-41.4°
28 June 2019	21.6cm	-18.9cm	-41.2°

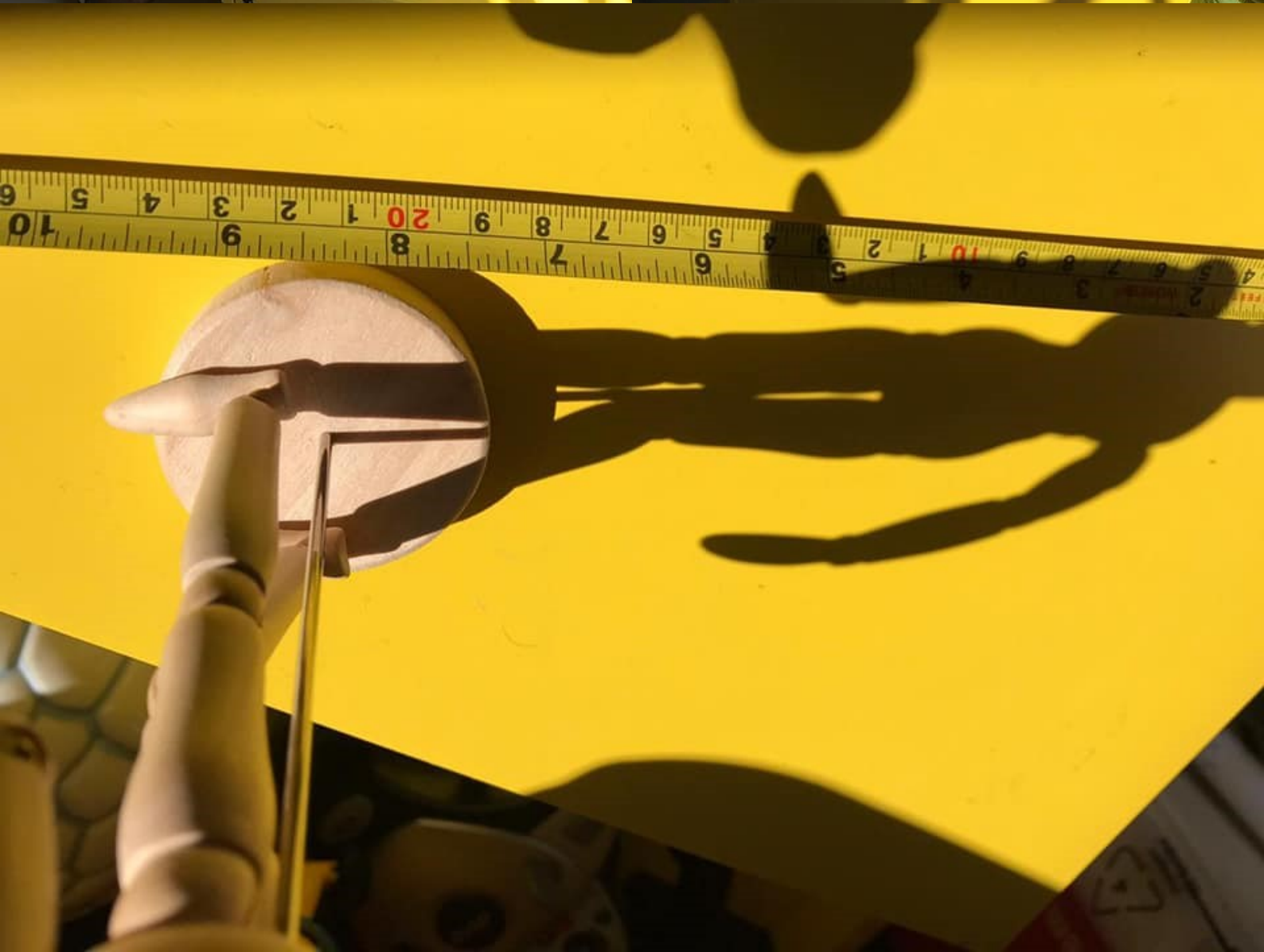
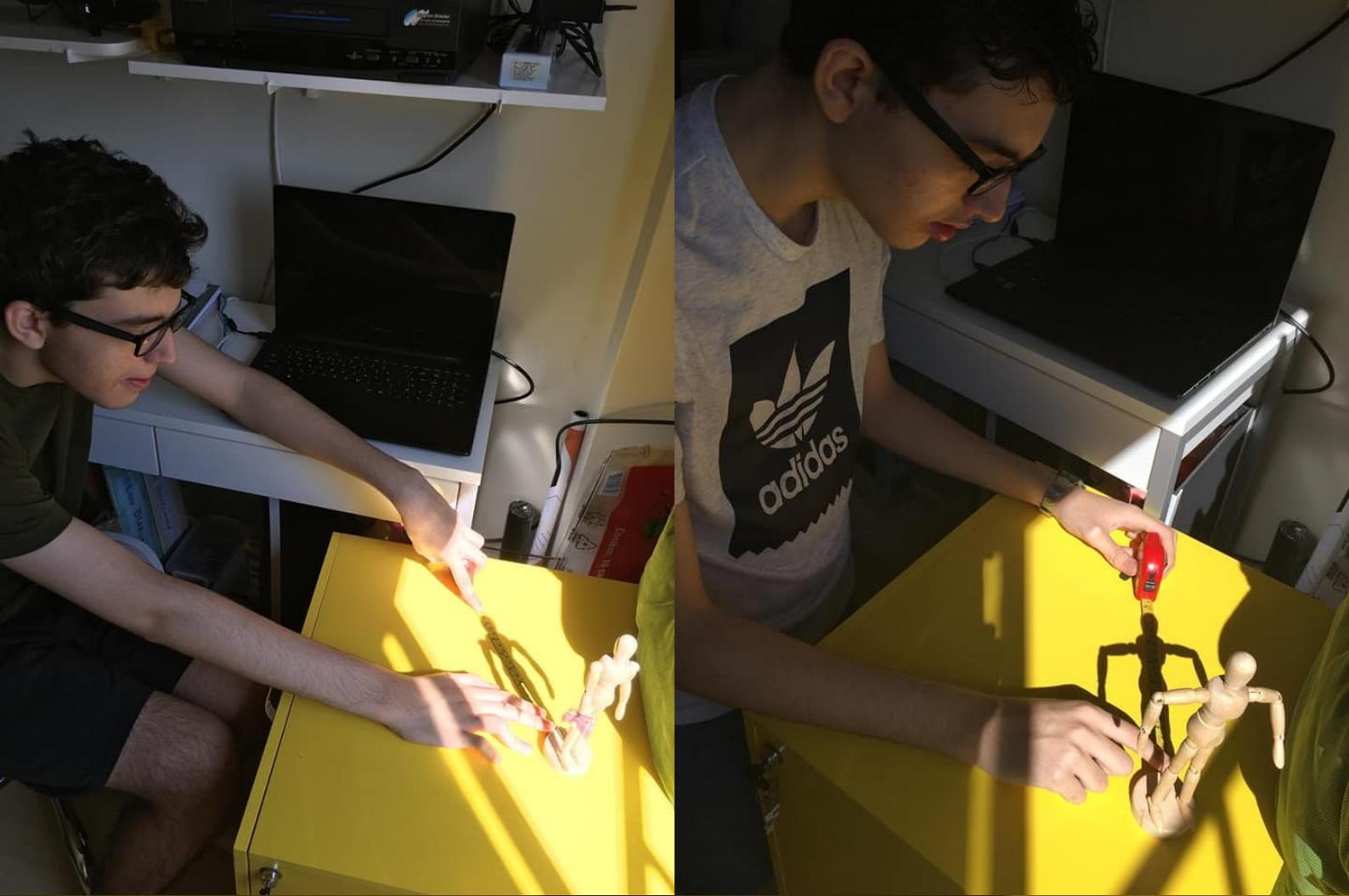
26/06/2019 (Busteni-Romania) Latitude: 45.416°

26/06/2019 (Andarai-Brazil) Latitude: -22.927°




$$\text{circumference} = \frac{360^\circ \times 7593\text{km}}{22.1^\circ + 41.4^\circ} = 43047 \text{ km}$$

Distance	Angle
circumference	360°
7593km	22.1° + 41.4°



# Aswan / Kom Ombo, Egypt

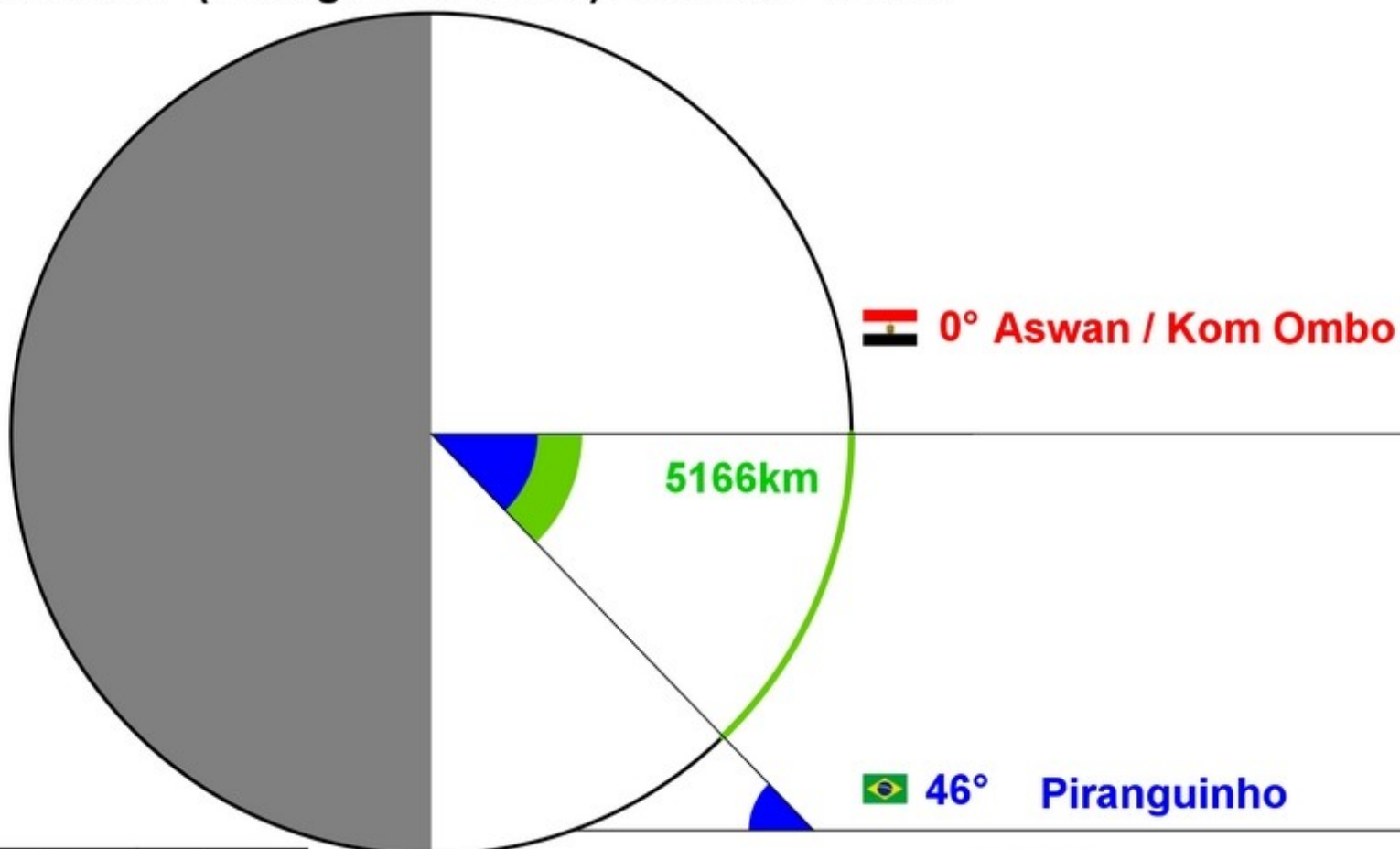


Flag	City	Country	School	Latitude (°) +N/-S	Longitude (°) +E/-W
	Aswan / Kom Ombo	Egypt		24.091	32.899

Date	Gnomon	Shadow	Angle
22 June 2019	10cm	0cm	0°

22/06/2019 (Aswan / Kom Ombo-Egypt) Latitude: 24.091°

22/06/2019 (Piranguinho-Brazil) Latitude: -22.411°



$$\text{circumference} = \frac{360^\circ \times 5166\text{km}}{0^\circ + 46^\circ} = 40430 \text{ km}$$

Distance	Angle
circumference	360°
5166km	0° + 46°





# Bizerte, Tunisia

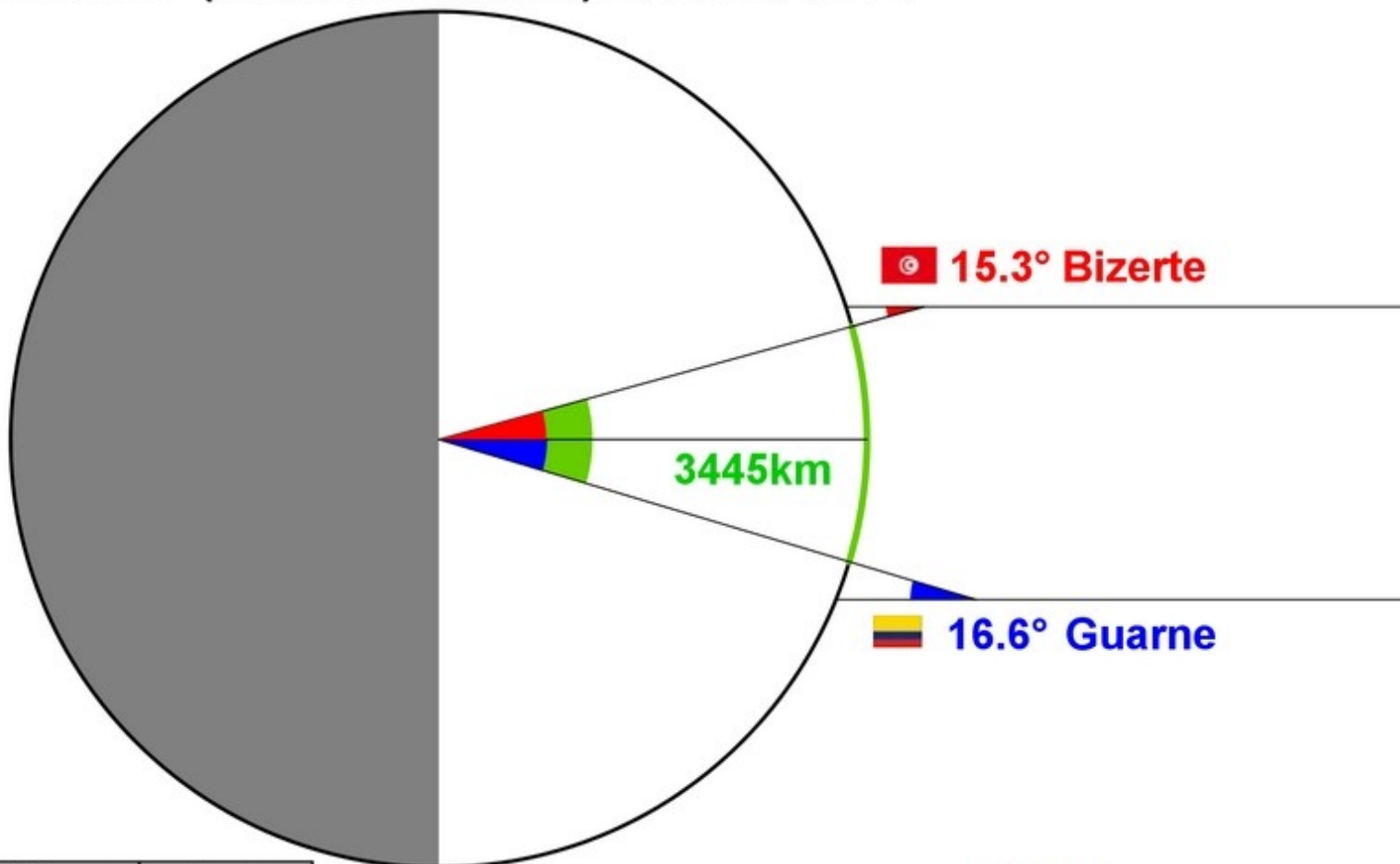


Flag	City	Country	School	Latitude (°) +N/-S	Longitude (°) +E/-W
	Bizerte	Tunisia	Ecole Primaire Raouabi	37.284	9.868

Date	Gnomon	Shadow	Angle
11 June 2019	48cm	13cm	15.2°
12 June 2019	48cm	13.1cm	15.3°
13 June 2019	34cm	8cm	13.2°

**12/06/2019 (Bizerte-Tunisia) Latitude: 37.284°**

**12/06/2019 (Guarne-Colombia) Latitude: 6.274°**



Distance	Angle
circumference	360°
3445km	15.3° + 16.6°

$$\text{circumference} = \frac{360^\circ \times 3445\text{km}}{15.3^\circ + 16.6^\circ} = 38878 \text{ km}$$








# Busteni, Romania

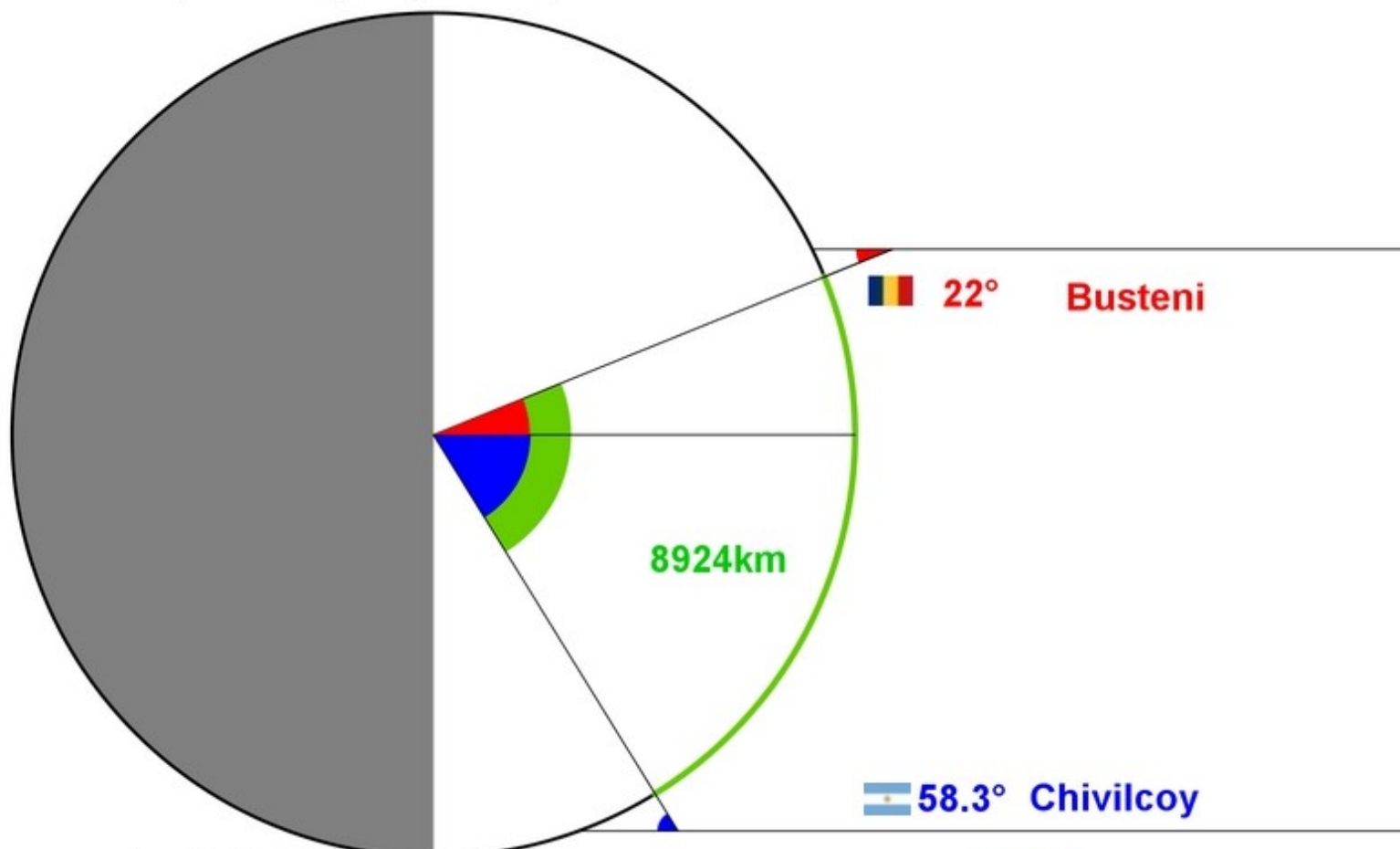


Flag	City	Country	School	Latitude (°) +N/-S	Longitude (°) +E/-W
	Busteni	Romania	Colegiul Ion Kalinderu	45.416	25.535

Date	Gnomon	Shadow	Angle
07 June 2019	100cm	41.4cm	22.5°
11 June 2019	100cm	40.9cm	22.2°
12 June 2019	17.1cm	7cm	22.3°
13 June 2019	24.6cm	10.0cm	22.1°
14 June 2019	147.8cm	60.0cm	22.1°
19 June 2019	17.3cm	7.0cm	22.0°
20 June 2019	37.1cm	15.0cm	22.0°
21 June 2019	34.6cm	14.0cm	22.0°
22 June 2019	100cm	40.4cm	22°
26 June 2019	86.2cm	35cm	22.1°
28 June 2019	108.0cm	44.0cm	22.2°

20/06/2019 (Busteni-Romania) Latitude: 45.416°

20/06/2019 (Chivilcoy-Argentina) Latitude: -34.911°



Distance	Angle
circumference	360°
8924km	22° + 58.3°

$$\text{circumference} = \frac{360^\circ \times 8924\text{km}}{22^\circ + 58.3^\circ} = 40008 \text{ km}$$







# Cameron Highlands, Malaysia

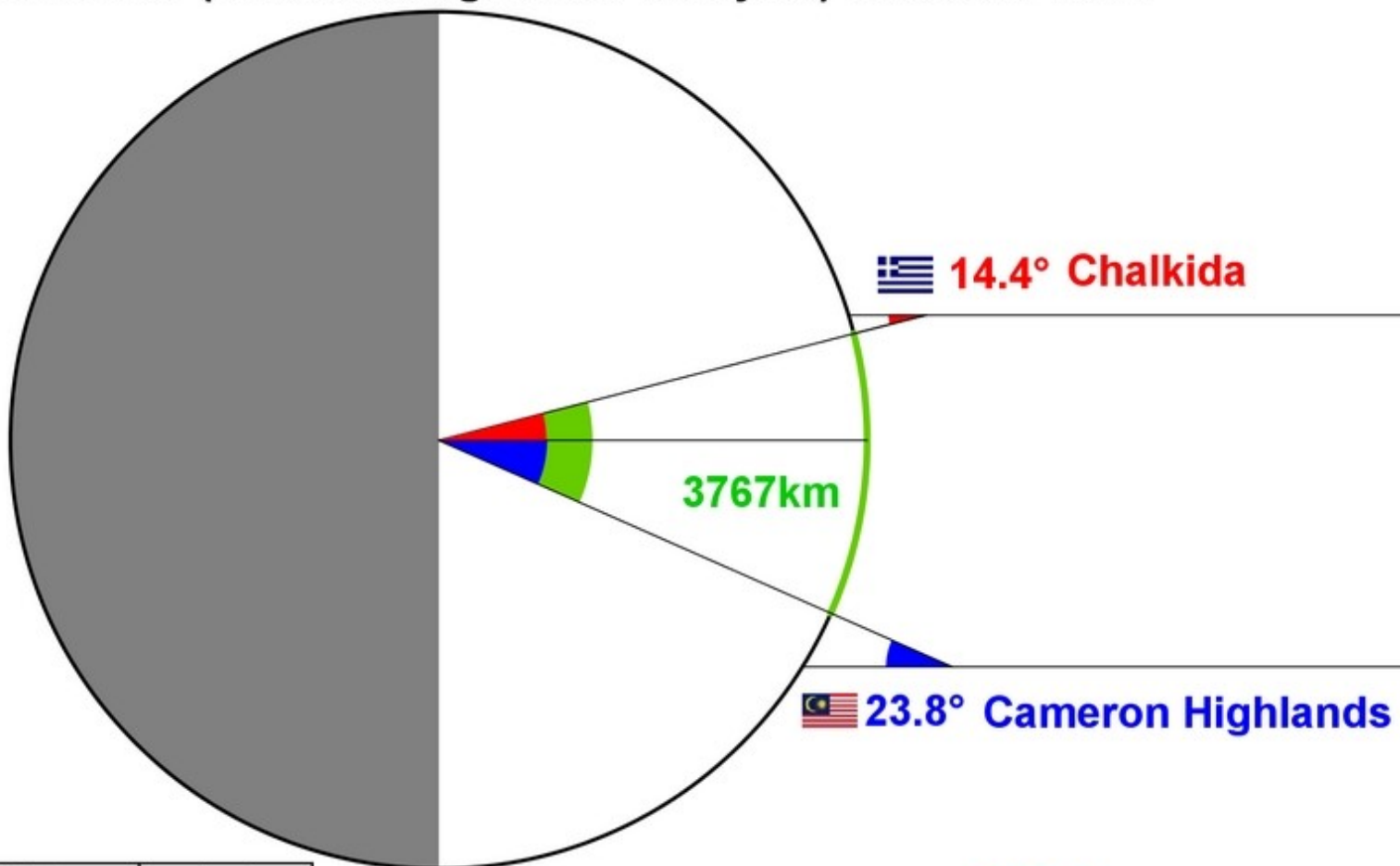


Flag	City	Country	School	Latitude (°) +N/-S	Longitude (°) +E/-W
	Cameron Highlands	Malaysia	SMK Kampung Raja	4.564	101.408

Date	Gnomon	Shadow	Angle
12 June 2019	79.5cm	-35.0cm	-23.8°

12/06/2019 (Chalkida-Greece) Latitude: 38.469°

12/06/2019 (Cameron Highlands-Malaysia) Latitude: 4.564°



Distance	Angle
circumference	360°
3767km	14.4°+23.8°

$$\text{circumference} = \frac{360^\circ \times 3767\text{km}}{14.4^\circ + 23.8^\circ} = 35501 \text{ km}$$





# Chalkida, Greece

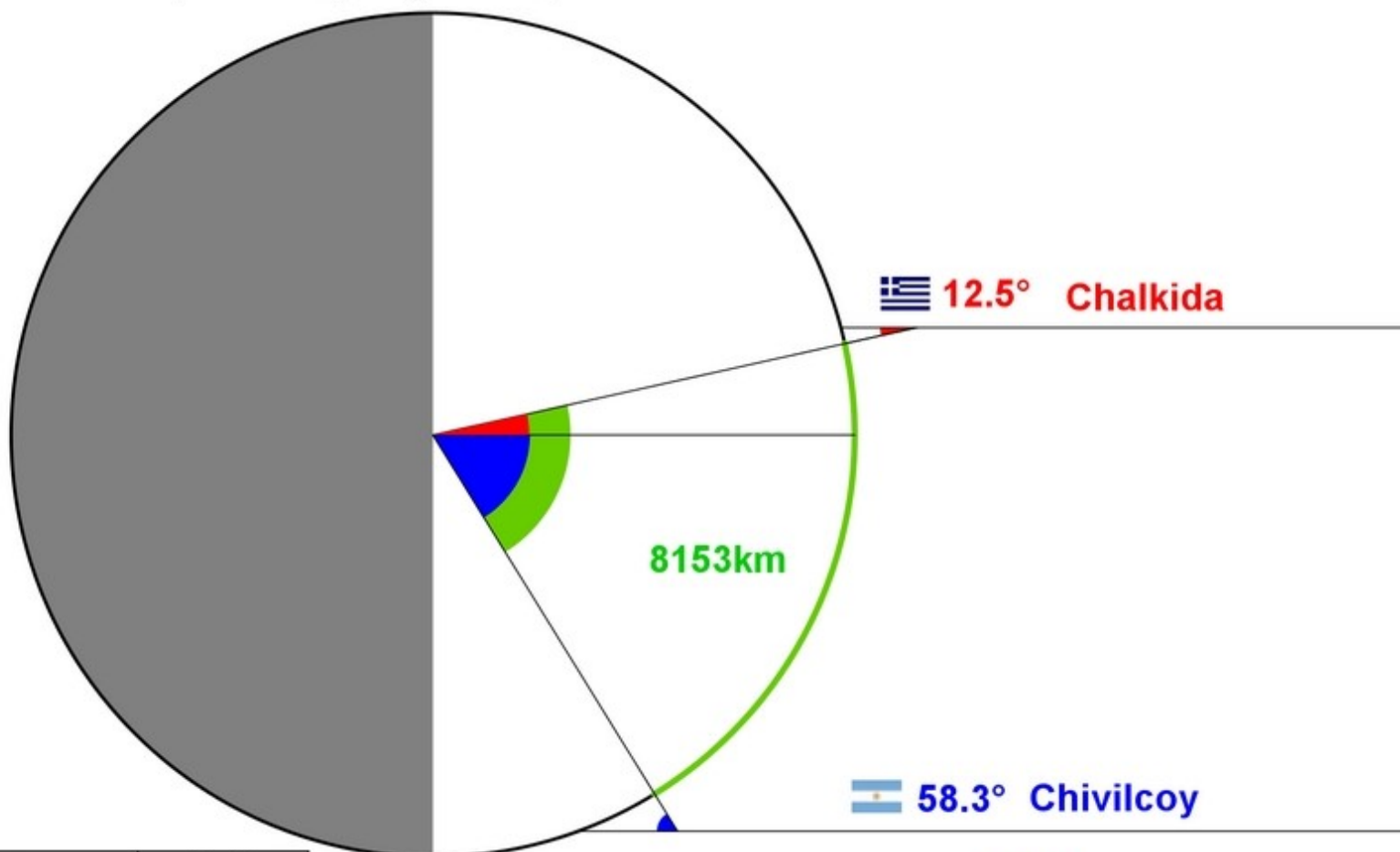


Flag	City	Country	School	Latitude (°) +N/-S	Longitude (°) +E/-W
	Chalkida	Greece	29th Kindergarten of Chalkida	38.469	23.580

Date	Gnomon	Shadow	Angle
12 June 2019	24.1cm	6.2cm	14.4°
20 June 2019	29.3cm	6.5cm	12.5°

20/06/2019 (Chalkida-Greece) Latitude: 38.469°

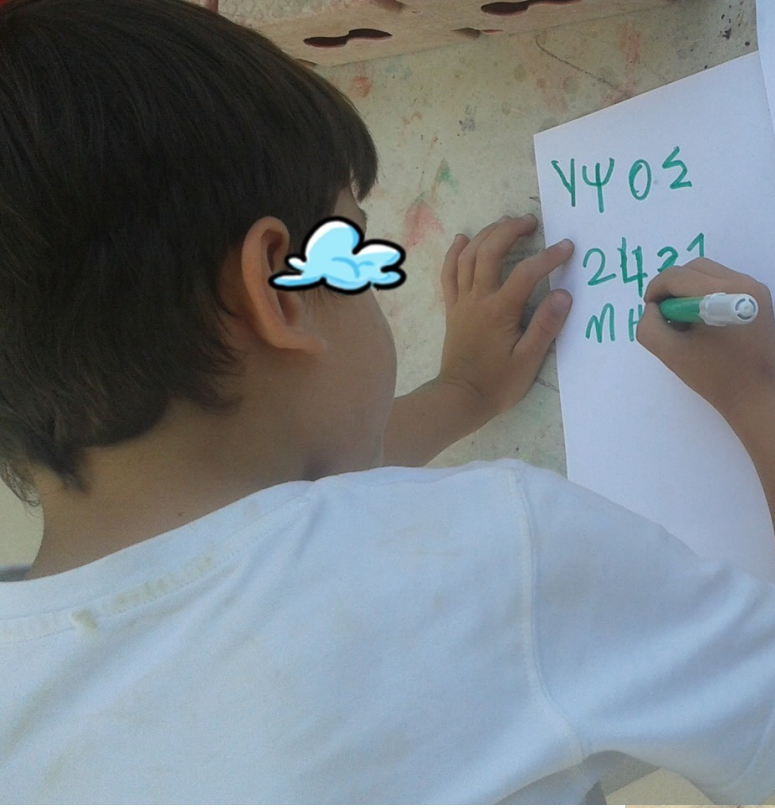
20/06/2019 (Chivilcoy-Argentina) Latitude: -34.911°



$$\text{circumference} = \frac{360^\circ \times 8153\text{km}}{12.5^\circ + 58.3^\circ} = 41456 \text{ km}$$

Distance	Angle
circumference	360°
8153km	12.5° + 58.3°







# Chivilcoy, Argentina

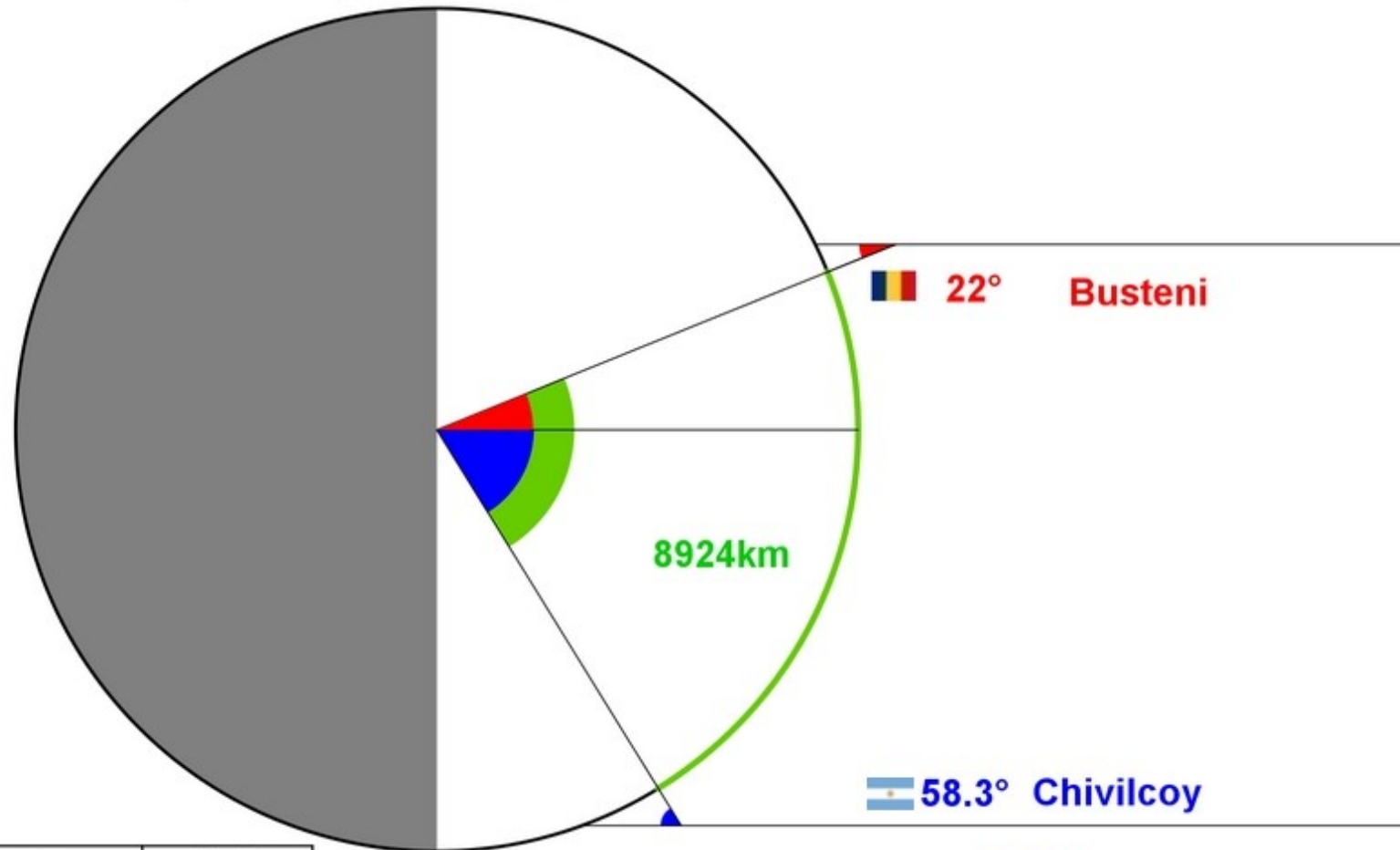


Flag	City	Country	School	Latitude (°) +N/-S	Longitude (°) +E/-W
	Chivilcoy	Argentina	Parque Cielos del Sur	-34.911	-60.014

Date	Gnomon	Shadow	Angle
20 June 2019	90.0cm	-145.7cm	-58.3°

20/06/2019 (Busteni-Romania) Latitude: 45.416°

20/06/2019 (Chivilcoy-Argentina) Latitude: -34.911°




Distance	Angle
circumference	360°
8924km	22° + 58.3°

$$\text{circumference} = \frac{360^\circ \times 8924\text{km}}{22^\circ + 58.3^\circ} = 40008 \text{ km}$$



# El Senbellawein, Egypt

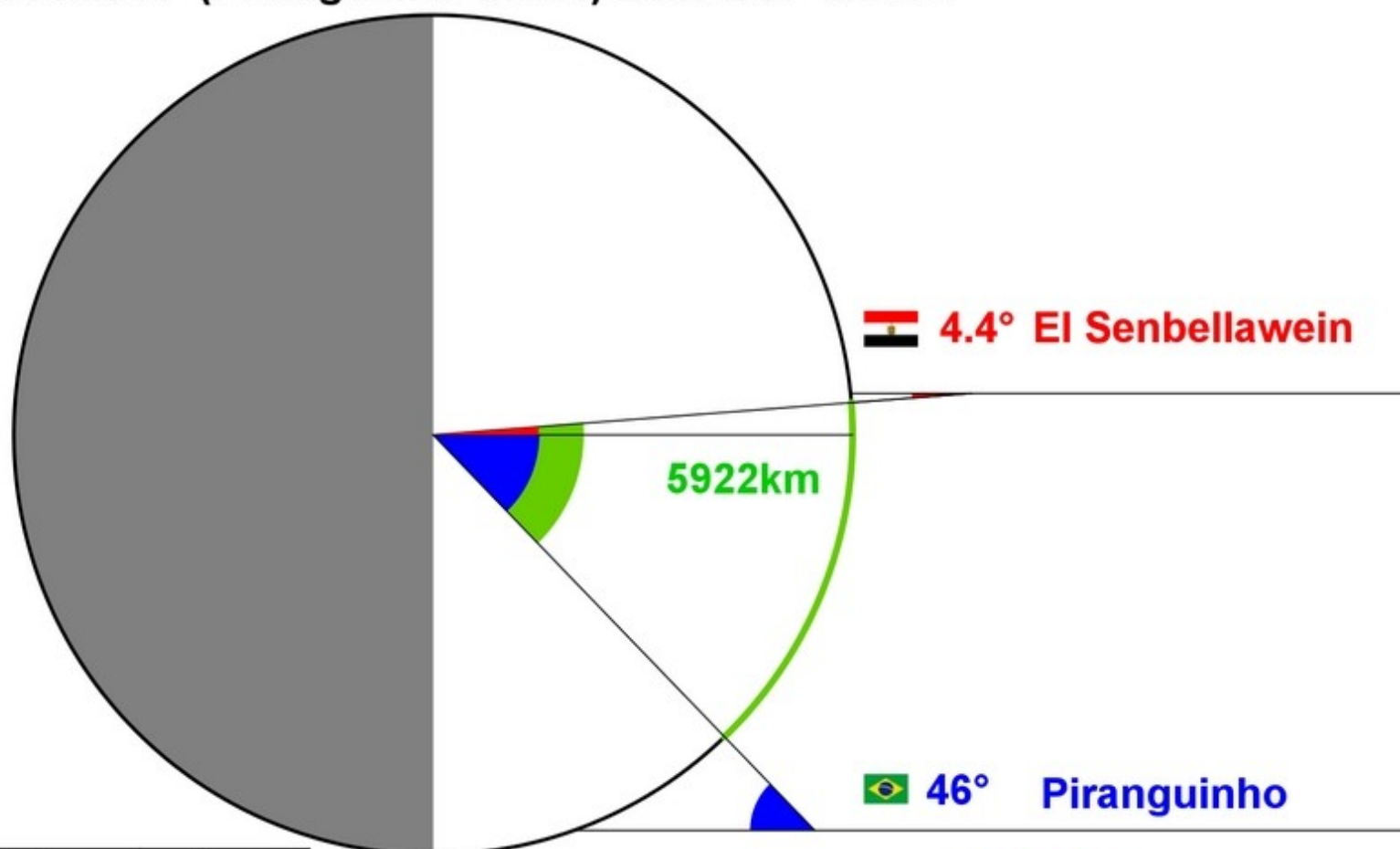


Flag	City	Country	School	Latitude (°) +N/-S	Longitude (°) +E/-W
	El Senbellawein	Egypt		30.891	31.455

Date	Gnomon	Shadow	Angle
22 June 2019	17cm	1.3cm	4.4°

22/06/2019 (El Senbellawein-Egypt) Latitude: 30.891°

22/06/2019 (Piranguinho-Brazil) Latitude: -22.411°



$$\text{circumference} = \frac{360^\circ \times 5922\text{km}}{4.4^\circ + 46^\circ} = 42300 \text{ km}$$


Distance	Angle
circumference	360°
5922km	4.4° + 46°





# Guarne, Colombia

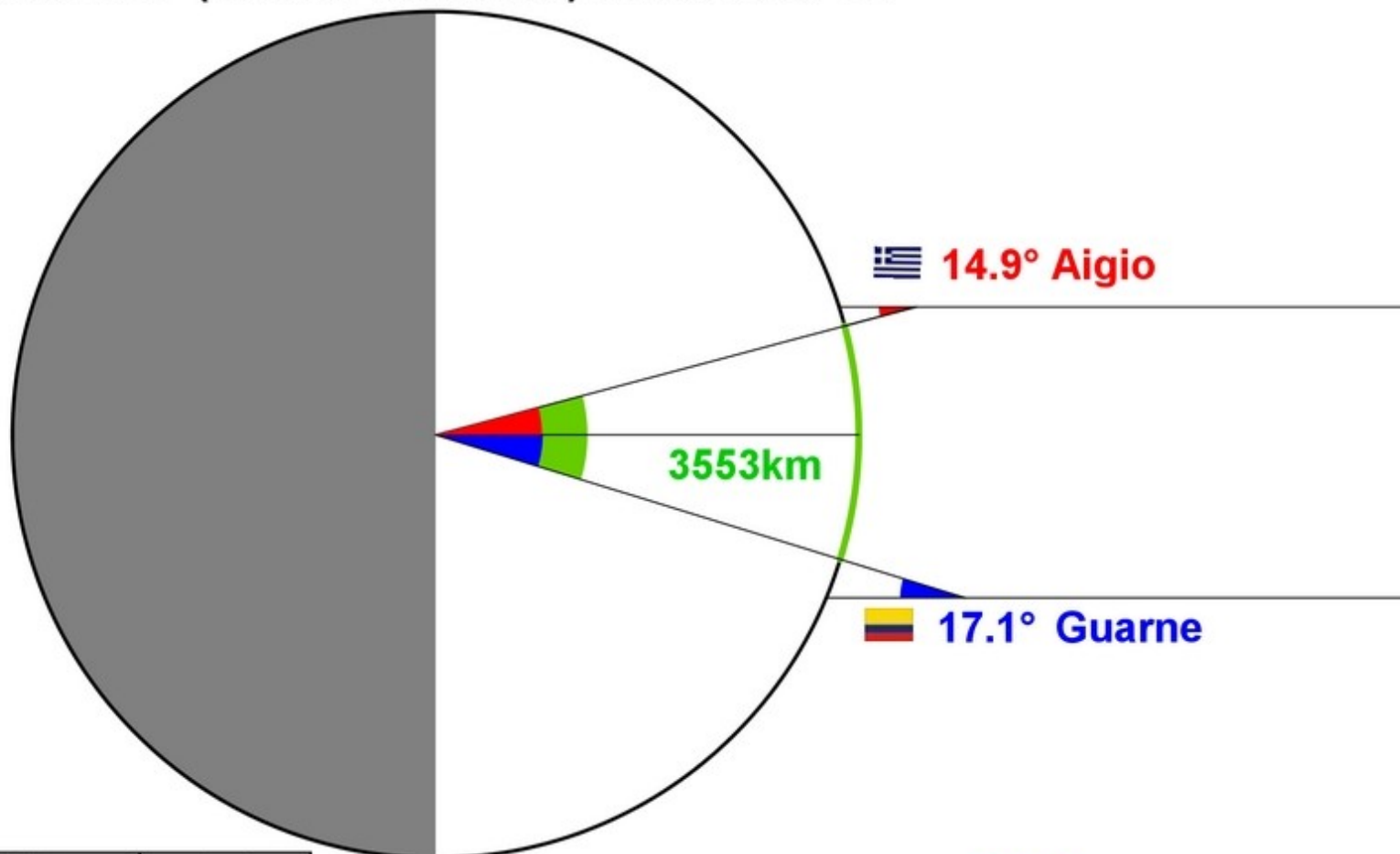


Flag	City	Country	School	Latitude (°) +N/-S	Longitude (°) +E/-W
	Guarne	Colombia	Grupo Astrofanáticos	6.274	-75.449

Date	Gnomon	Shadow	Angle
04 June 2019	30.5cm	-8.8cm	-16.1°
10 June 2019	30.5cm	-9cm	-16.4°
12 June 2019	30.5cm	-9.1cm	-16.6°
18 June 2019	30.5cm	-9.4cm	-17.1°
19 June 2019	30.5cm	-9.5cm	-17.3°
21 June 2019	31.0cm	-9.5cm	-17.0°
26 June 2019	30.5cm	-9.1cm	-16.6°

**18/06/2019 (Aigio-Greece) Latitude: 38.252°**

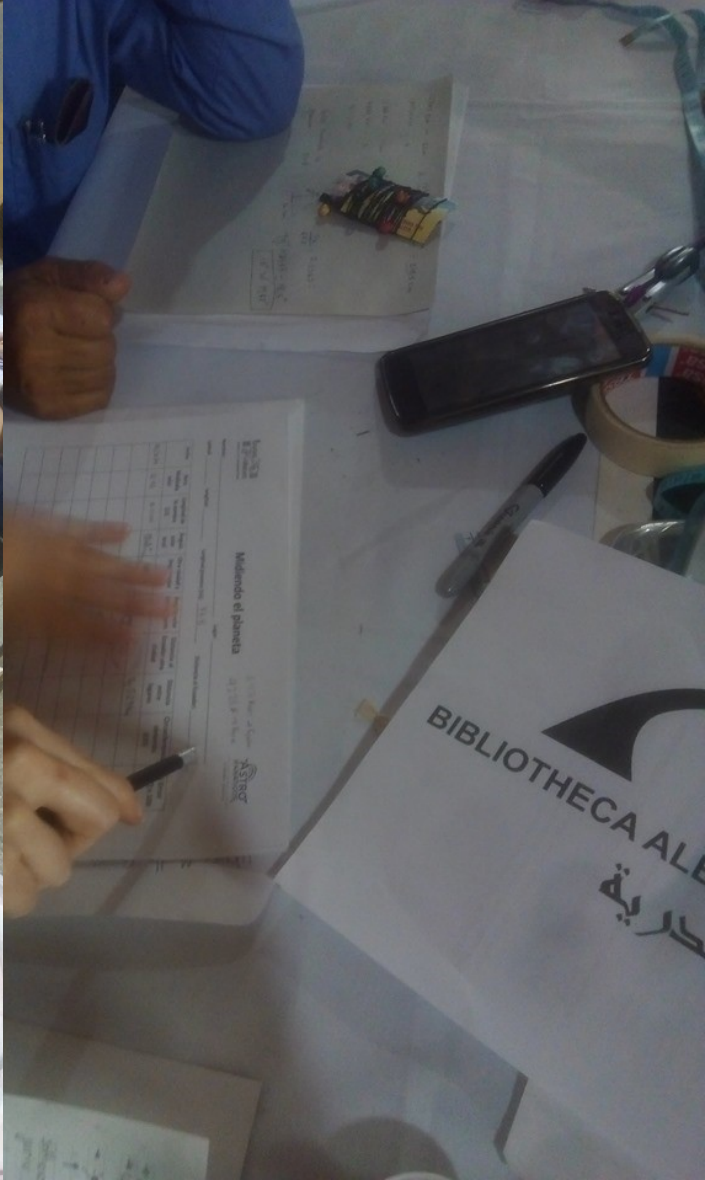
**18/06/2019 (Guarne-Colombia) Latitude: 6.274°**



Distance	Angle
circumference	360°
3553km	14.9° + 17.1°

$$\text{circumference} = \frac{360^\circ \times 3553\text{km}}{14.9^\circ + 17.1^\circ} = 39971 \text{ km}$$





BIBLIOTHECA AL  
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# Itajubá, Brazil

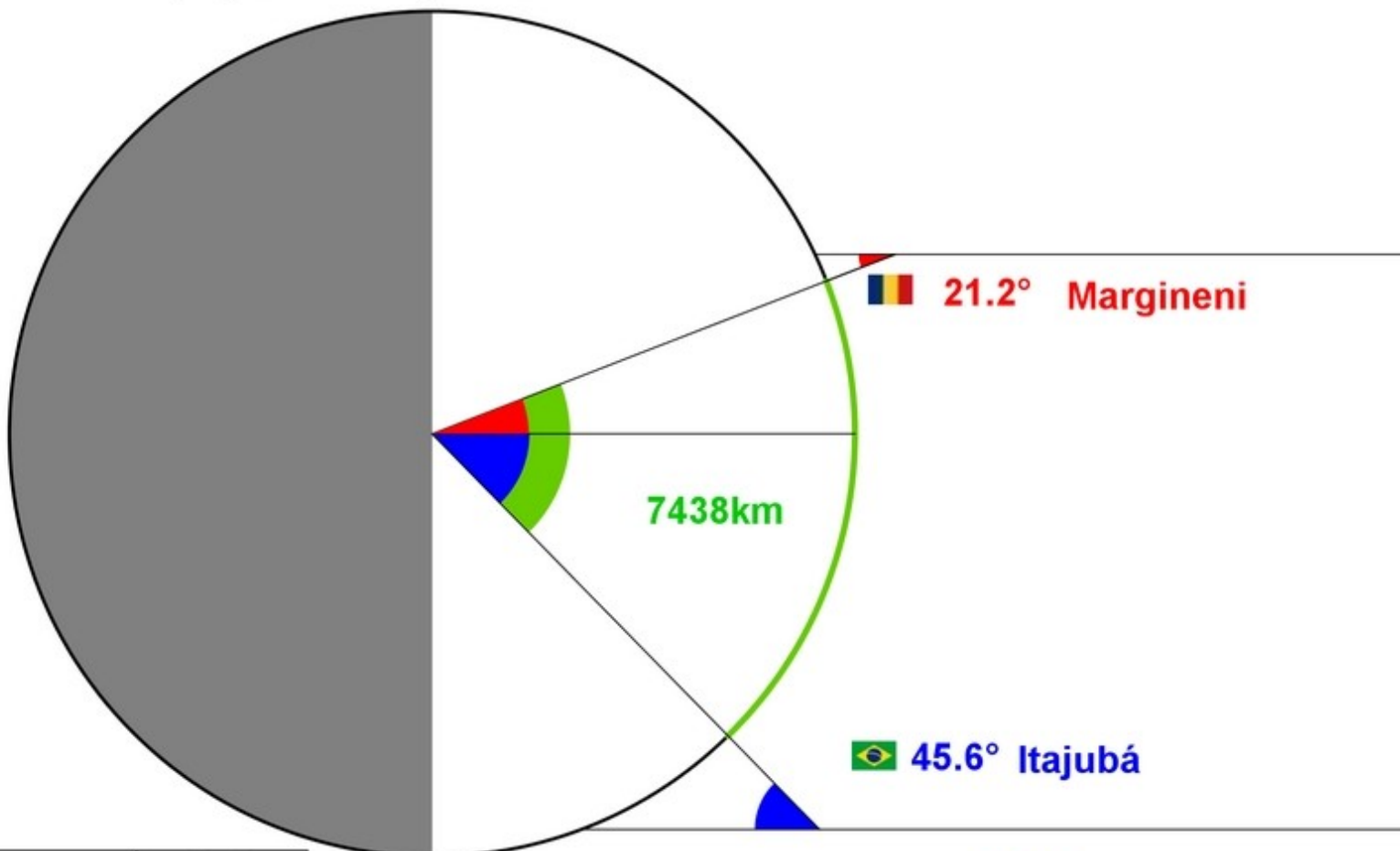


Flag	City	Country	School	Latitude (°) +N/-S	Longitude (°) +E/-W
	Itajubá	Brazil	Universidade Federal de Itajubá	-22.415	-45.449

Date	Gnomon	Shadow	Angle
21 June 2019	80.0cm	-81.7cm	-45.6°

21/06/2019 (Margineni-Romania) Latitude: 44.533°

21/06/2019 (Itajubá-Brazil) Latitude: -22.415°



Distance	Angle
circumference	360°
7438km	21.2° + 45.6°

$$\text{circumference} = \frac{360^\circ \times 7438\text{km}}{21.2^\circ + 45.6^\circ} = 40085 \text{ km}$$







# Lafrançaise, France

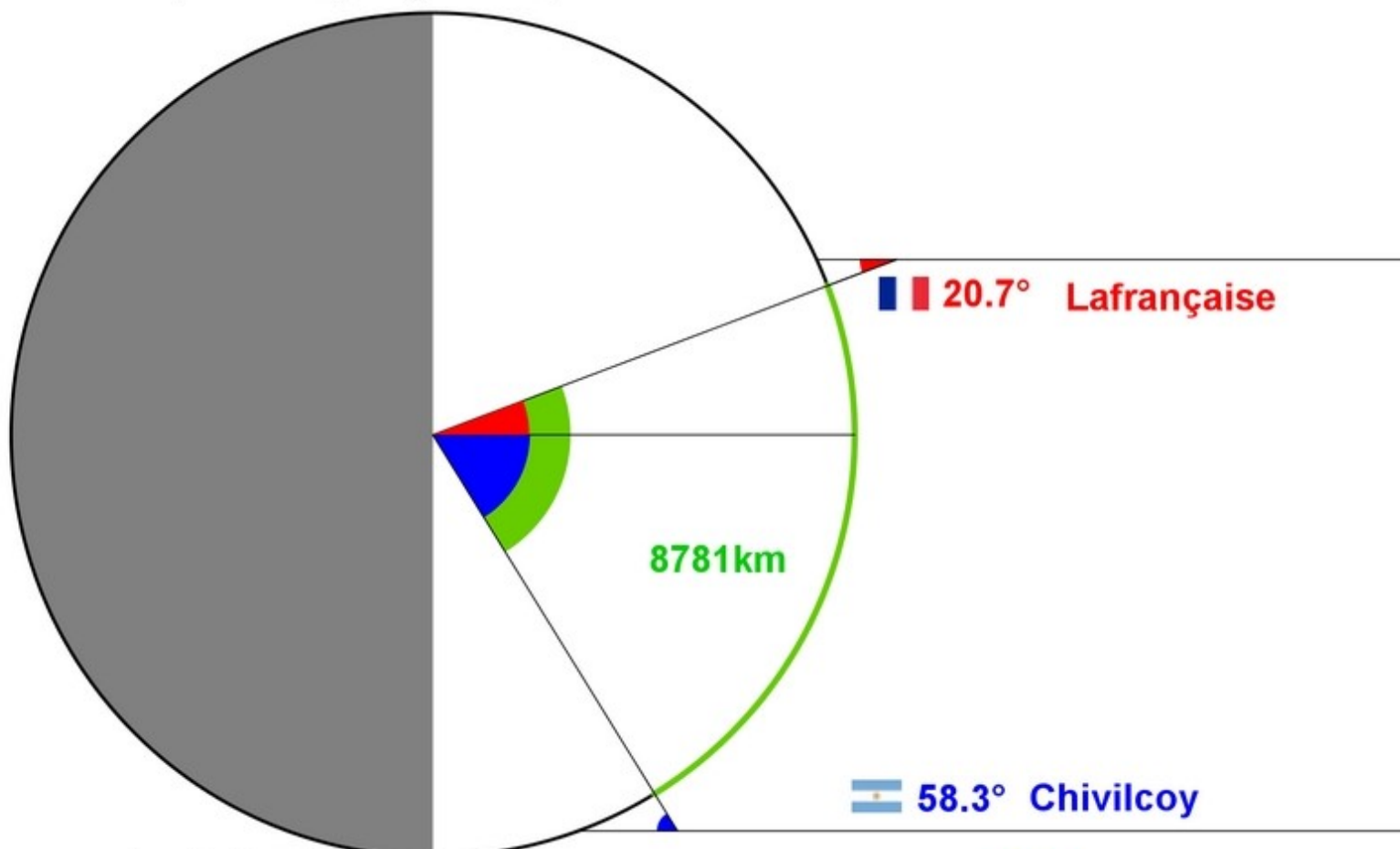


Flag	City	Country	School	Latitude (°) +N/-S	Longitude (°) +E/-W
	Lafrançaise	France	Collège Antonin Perbosc	44.127	1.237

Date	Gnomon	Shadow	Angle
03 June 2019	100.0cm	41.8cm	22.7°
06 June 2019	100cm	39.8cm	21.7°
07 June 2019	100cm	39.4cm	21.5°
13 June 2019	100.0cm	38.5cm	21.1°
14 June 2019	100.0cm	38.0cm	20.8°
20 June 2019	100.0cm	37.8cm	20.7°
21 June 2019	100.0cm	37.7cm	20.7°
24 June 2019	100.0cm	38cm	20.8°

20/06/2019 (Lafrançaise-France) Latitude: 44.127°

20/06/2019 (Chivilcoy-Argentina) Latitude: -34.911°



$$\text{circumference} = \frac{360^\circ \times 8781\text{km}}{20.7^\circ + 58.3^\circ} = 40015 \text{ km}$$

Distance	Angle
circumference	360°
8781km	20.7° + 58.3°







# Mansourah, Egypt

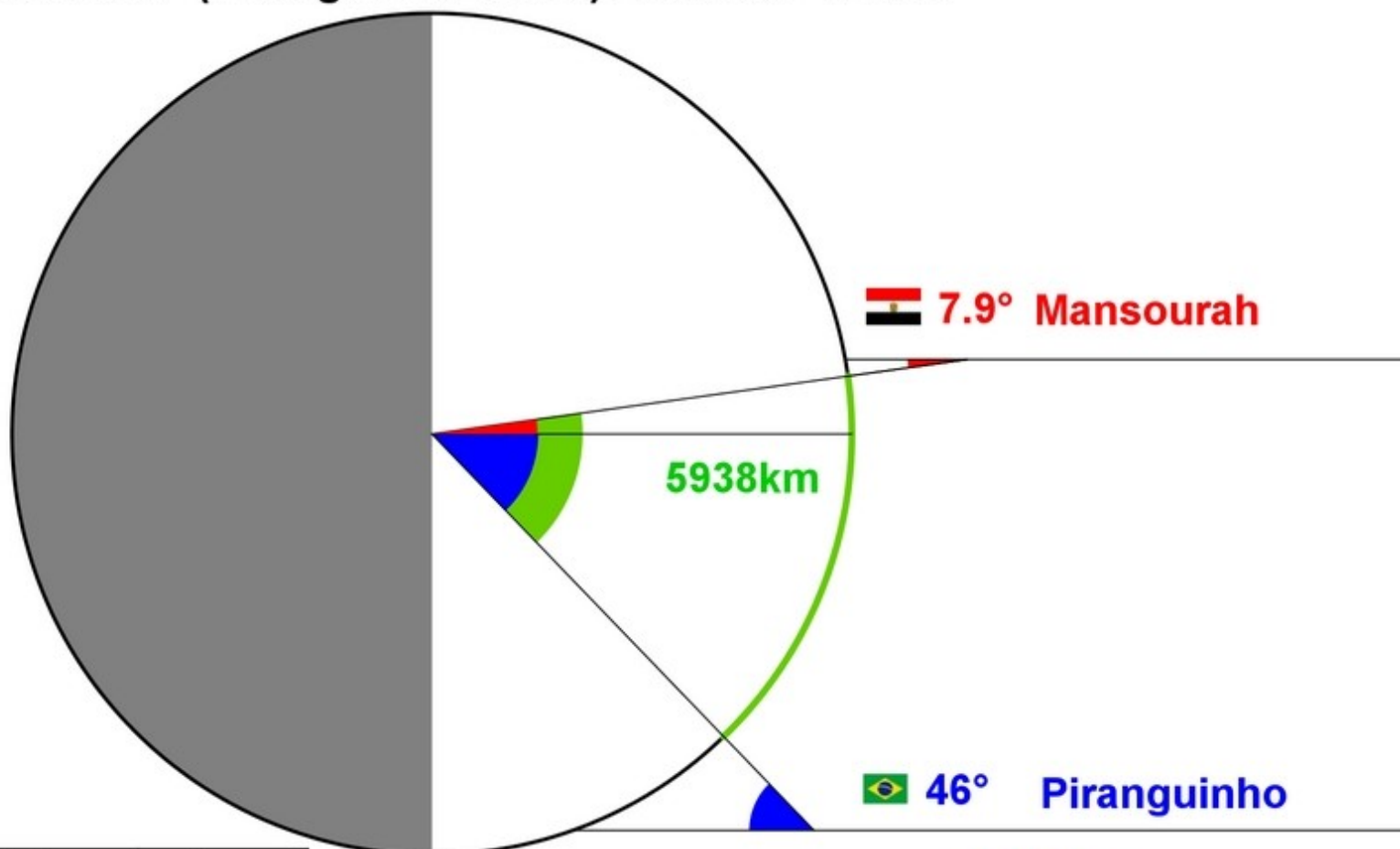


Flag	City	Country	School	Latitude (°) +N/-S	Longitude (°) +E/-W
	Mansourah	Egypt		31.038	31.382

Date	Gnomon	Shadow	Angle
22 June 2019	18.0cm	2.5cm	7.9°

22/06/2019 (Mansourah-Egypt) Latitude: 31.038°

22/06/2019 (Piranguinho-Brazil) Latitude: -22.411°



$$\text{circumference} = \frac{360^\circ \times 5938\text{km}}{7.9^\circ + 46^\circ} = 39660 \text{ km}$$

Distance	Angle
circumference	360°
5938km	7.9° + 46°





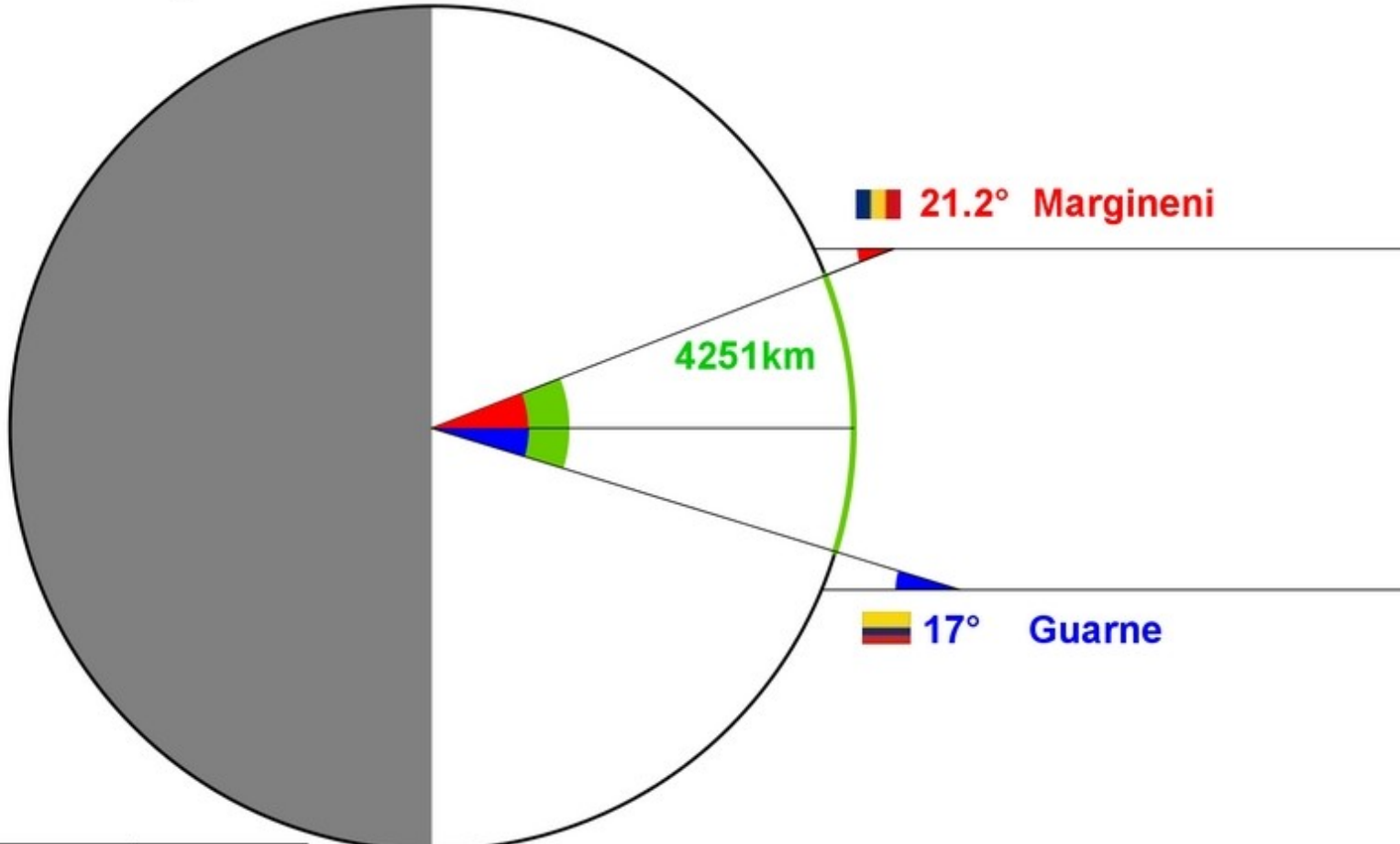
# Margineni, Romania



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

Date	Gnomon	Shadow	Angle
21 June 2019	100.0cm	38.7cm	21.2°

21/06/2019 (Margineni-Romania) Latitude: 44.533°  
 21/06/2019 (Guarne-Colombia) Latitude: 6.274°



Distance	Angle
circumference	360°
4251km	21.2° + 17°


circumference =  $\frac{360^\circ \times 4251\text{km}}{21.2^\circ + 17^\circ} = 40062 \text{ km}$





# Mohammedia, Tunisia

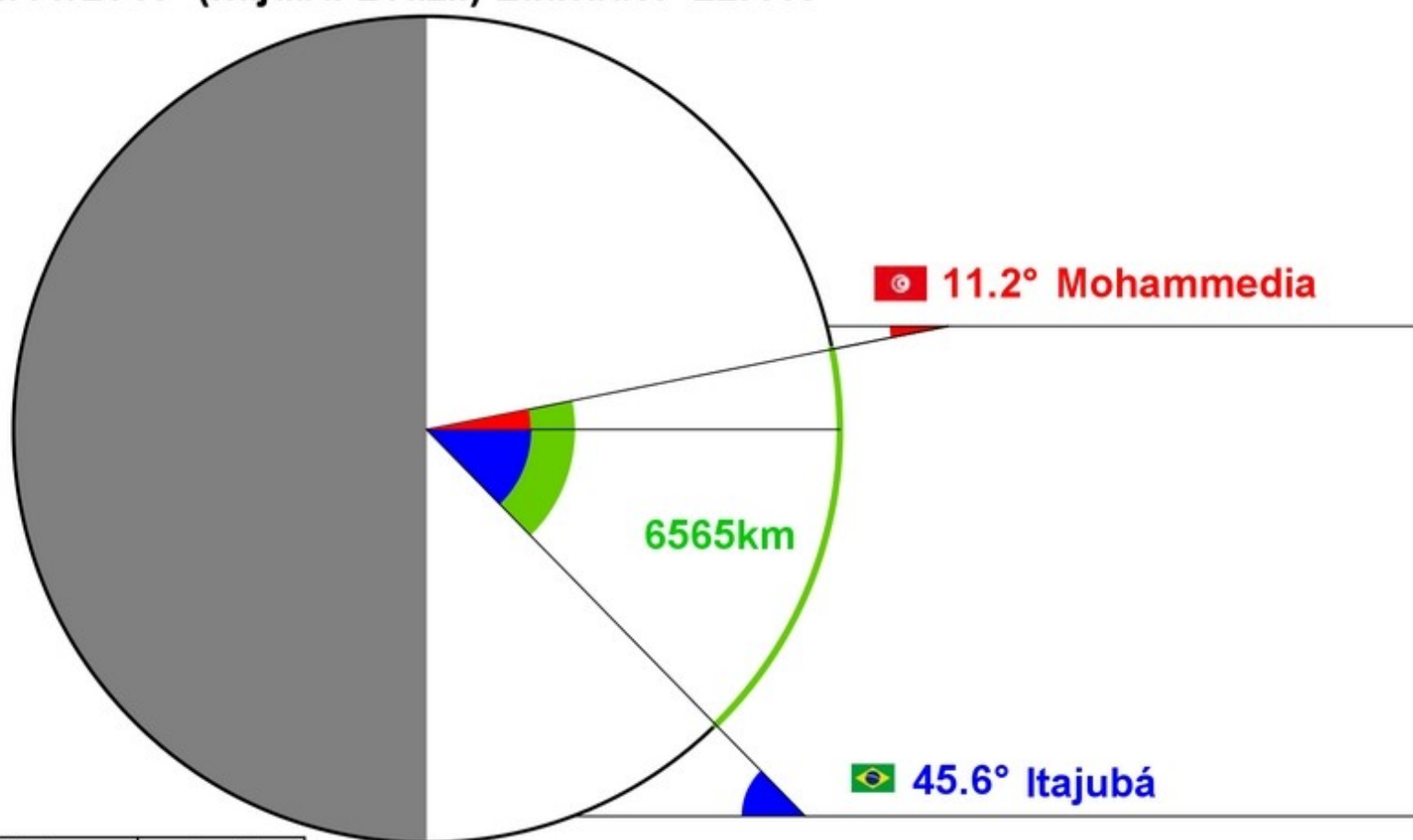


Flag	City	Country	School	Latitude (°) +N/-S	Longitude (°) +E/-W
	Mohammedia	Tunisia	Lycée M'hamdia	36.678	10.152

Date	Gnomon	Shadow	Angle
01 June 2019	97.0cm	28.0cm	16.1°
20 June 2019	96.0cm	19.0cm	11.2°
21 June 2019	126.0cm	25.0cm	11.2°
23 June 2019	100cm	24cm	13.5°

21/06/2019 (Mohammedia-Tunisia) Latitude: 36.678°

21/06/2019 (Itajubá-Brazil) Latitude: -22.415°



Distance	Angle
circumference	360°
6565km	11.2°+45.6°

$$\text{circumference} = \frac{360^\circ \times 6565\text{km}}{11.2^\circ + 45.6^\circ} = 41609 \text{ km}$$







# Petroupoli, Greece

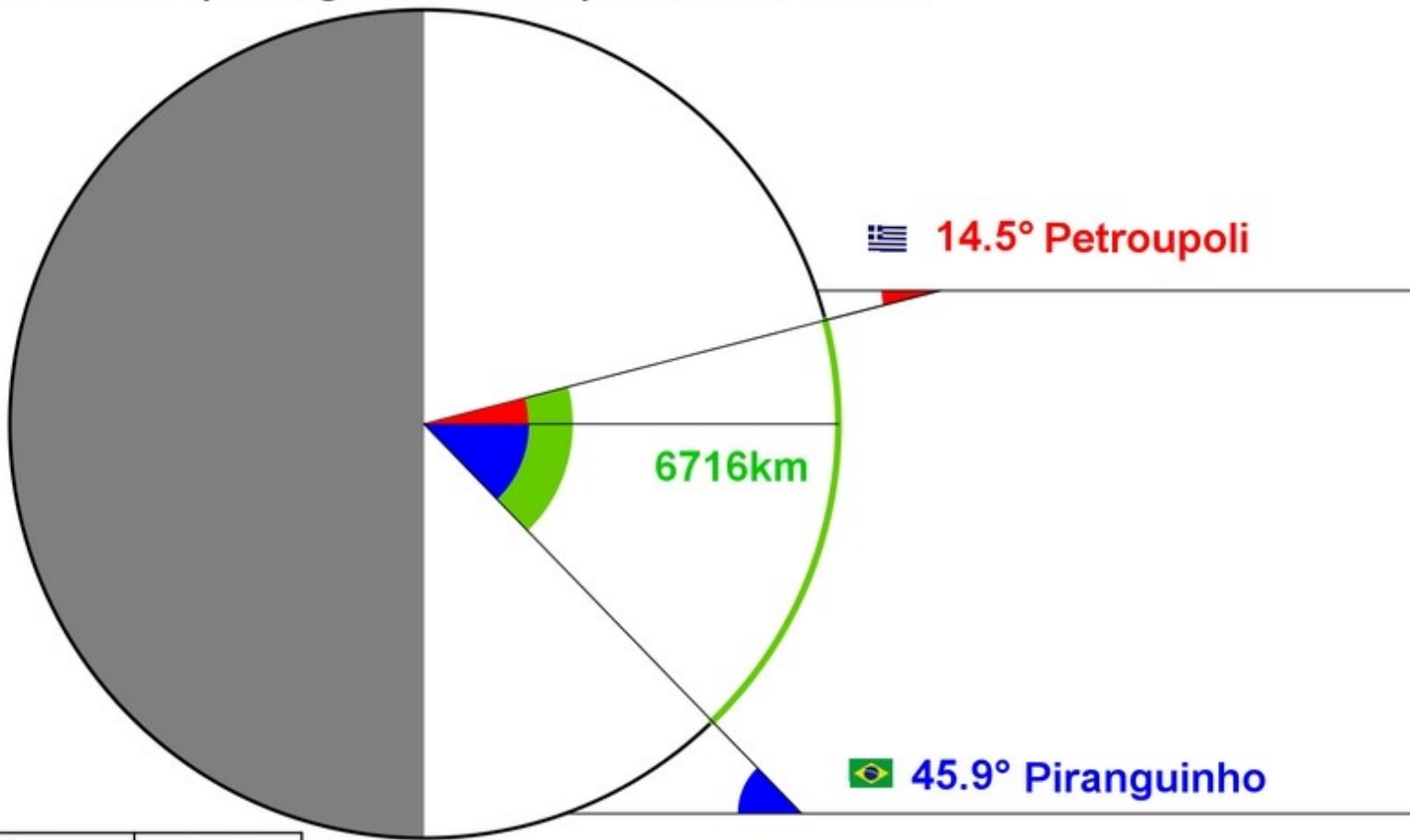


Flag	City	Country	School	Latitude (°) +N/-S	Longitude (°) +E/-W
	Petroupoli	Greece	4o Junior High School	38.036	23.674

Date	Gnomon	Shadow	Angle
07 June 2019	52.3cm	14.4cm	15.4°
10 June 2019	52.3cm	14cm	15°
13 June 2019	52.3cm	13.8cm	14.8°
14 June 2019	52.3cm	13.7cm	14.7°
20 June 2019	52.3cm	13.5cm	14.5°
21 June 2019	60cm	15.5cm	14.5°

20/06/2019 (Petroupoli-Greece) Latitude: 38.036°

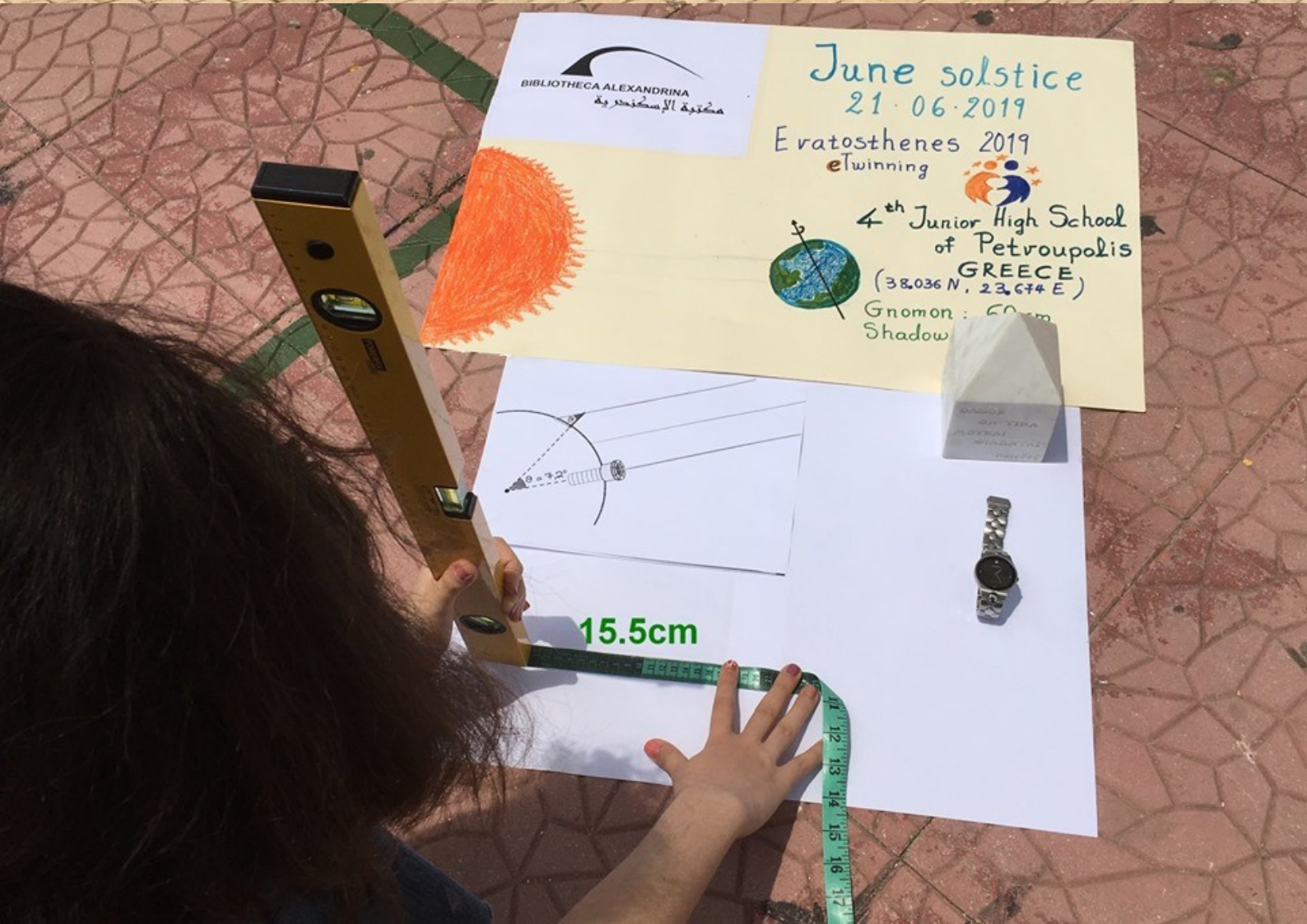
20/06/2019 (Piranguinho-Brazil) Latitude: -22.411°



Distance	Angle
circumference	360°
6716km	14.5°+ 45.9°

$$\text{circumference} = \frac{360^\circ \times 6716\text{km}}{14.5^\circ + 45.9^\circ} = 40029 \text{ km}$$







# Piranguinho, Brazil

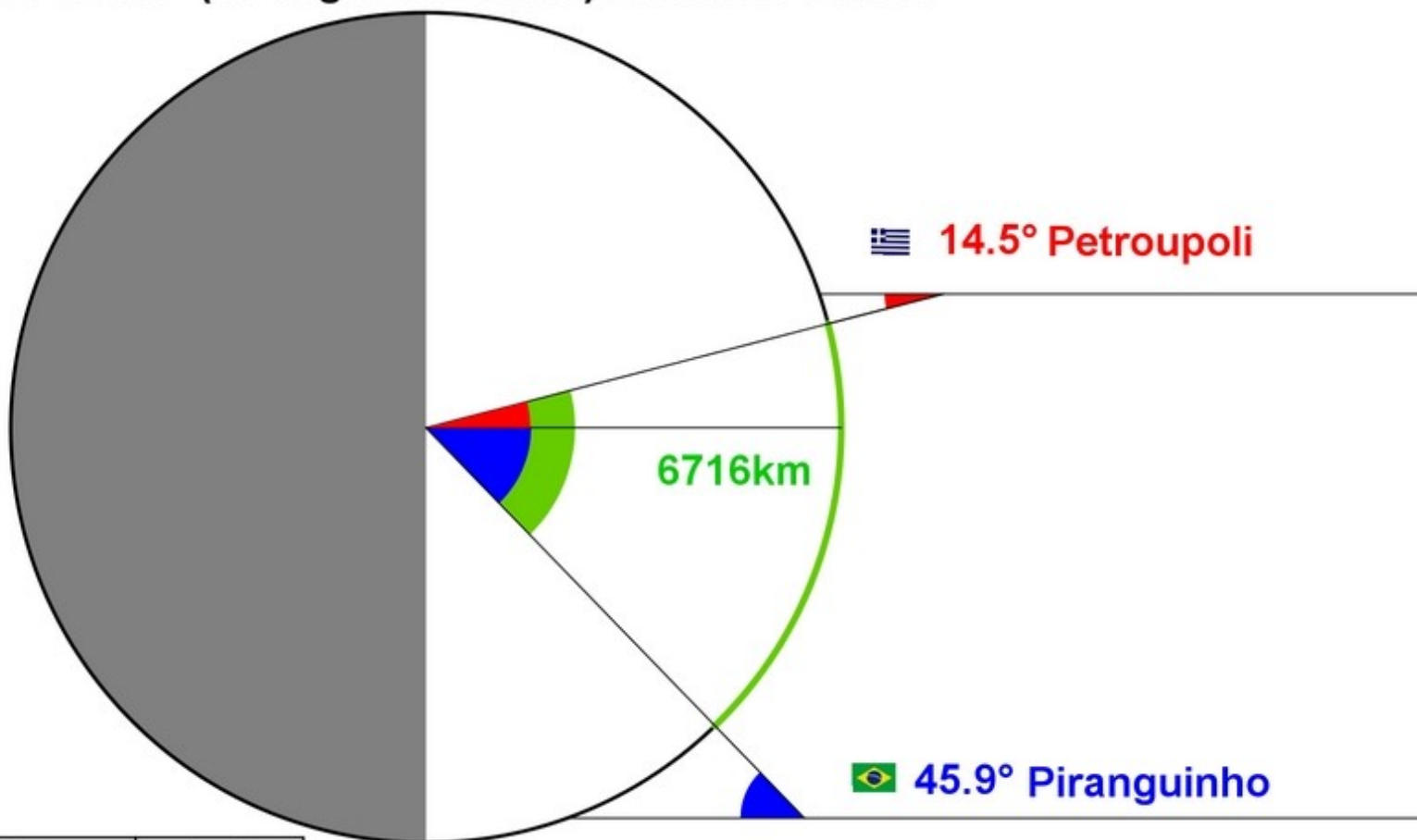


Flag	City	Country	School	Latitude (°) +N/-S	Longitude (°) +E/-W
	Piranguinho	Brazil	Universidade Federal de Itajubá	-22.411	-45.535

Date	Gnomon	Shadow	Angle
14 June 2019	70.0cm	-71.9cm	-45.8°
20 June 2019	70.0cm	-72.3cm	-45.9°
22 June 2019	70.0cm	-72.4cm	-46.0°
25 June 2019	70cm	-72.3cm	-45.9°

20/06/2019 (Petroupoli-Greece) Latitude: 38.036°

20/06/2019 (Piranguinho-Brazil) Latitude: -22.411°



 14.5° Petroupoli

 45.9° Piranguinho

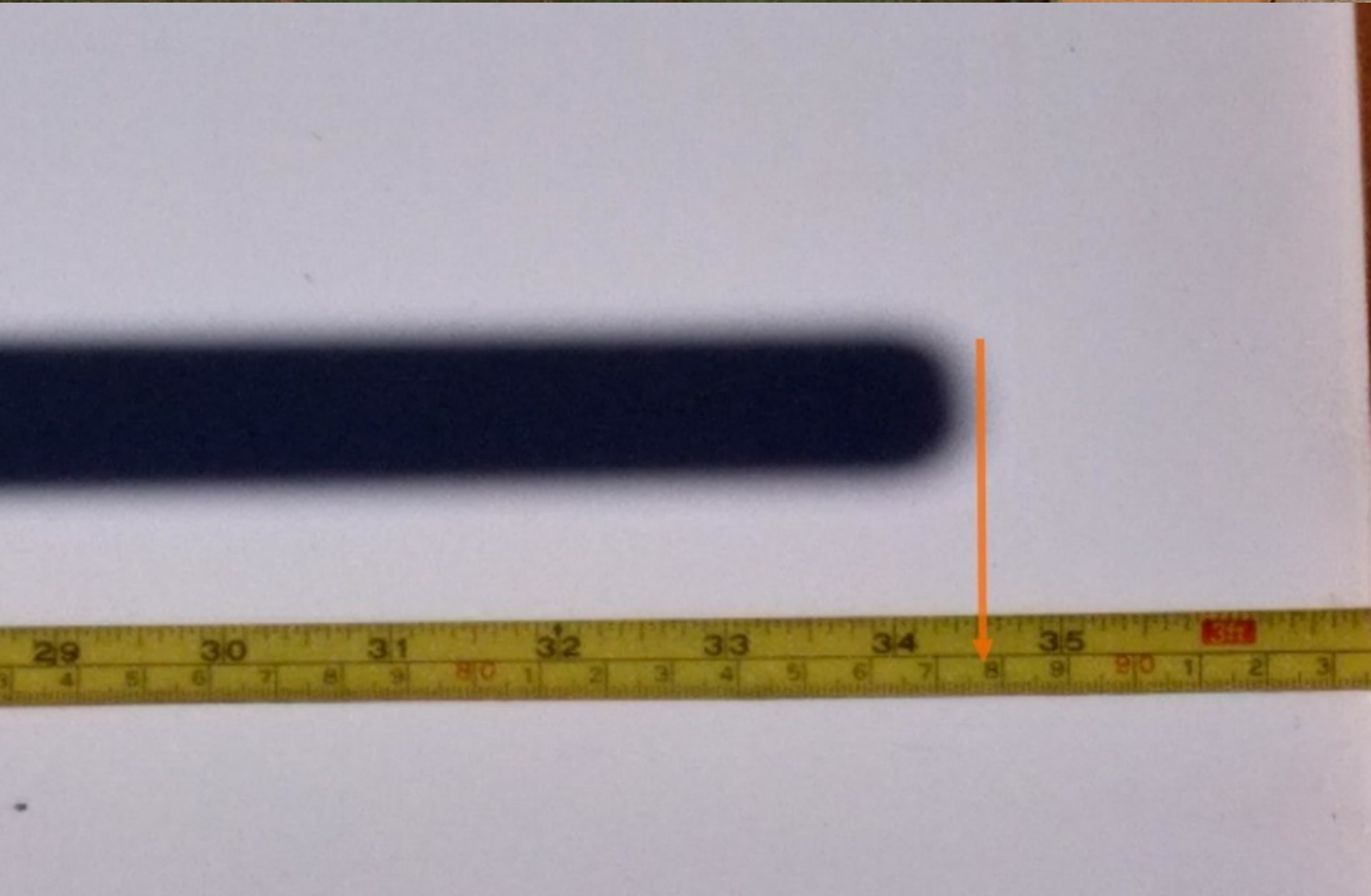
Distance	Angle
circumference	360°
6716km	14.5°+ 45.9°

$$\text{circumference} = \frac{360^\circ \times 6716\text{km}}{14.5^\circ + 45.9^\circ} = 40029 \text{ km}$$





14.06.2019



# Port Said, Egypt

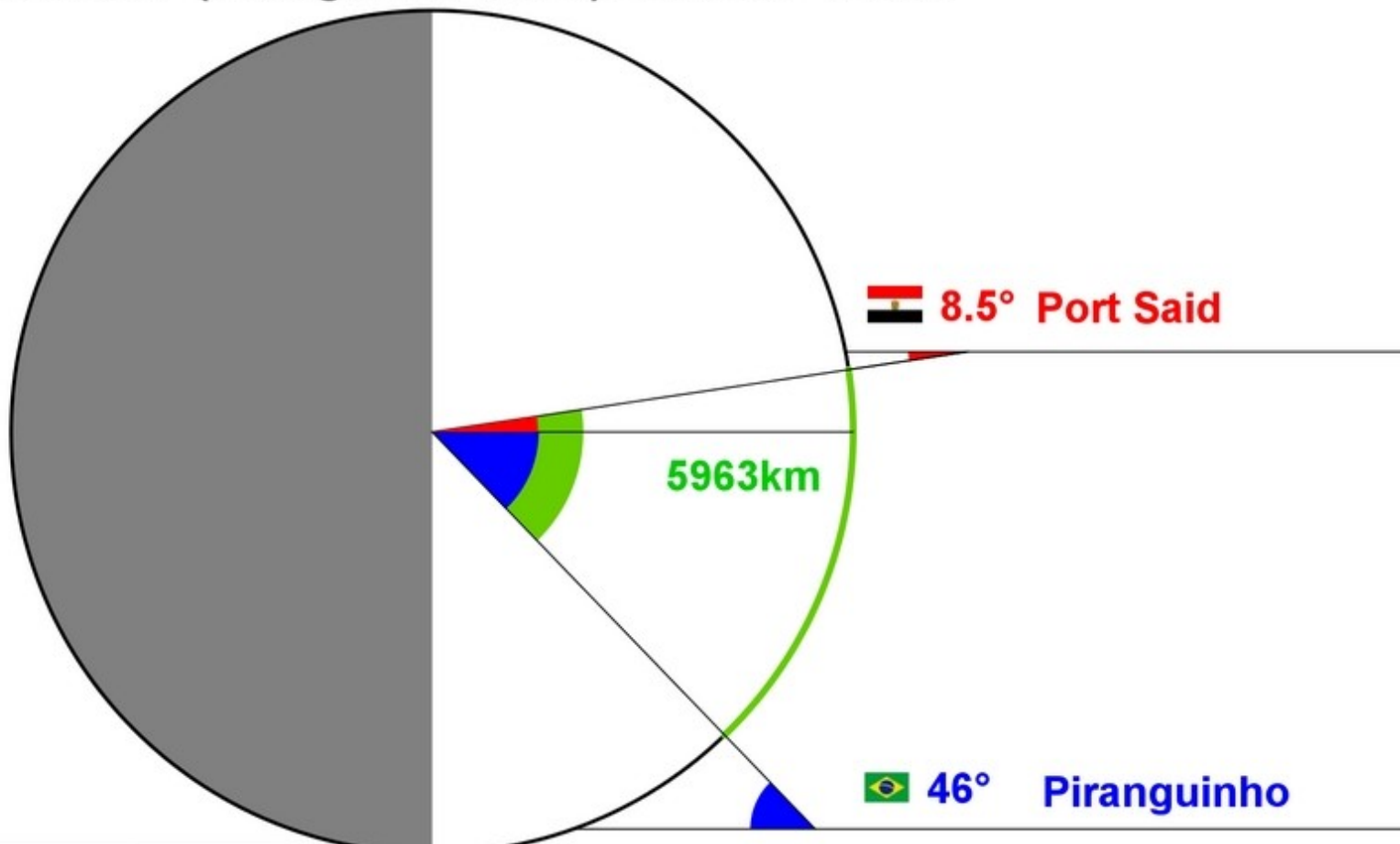


Flag	City	Country	School	Latitude (°) +N/-S	Longitude (°) +E/-W
	Port Said	Egypt		31.265	32.302

Date	Gnomon	Shadow	Angle
22 June 2019	20cm	3cm	8.5°

**22/06/2019 (Port Said-Egypt) Latitude: 31.265°**

**22/06/2019 (Piranguinho-Brazil) Latitude: -22.411°**



Distance	Angle
circumference	360°
5963km	8.5° + 46°


$$\text{circumference} = \frac{360^\circ \times 5963\text{km}}{8.5^\circ + 46^\circ} = 39389 \text{ km}$$





# Rio de Janeiro CENOM, Brazil

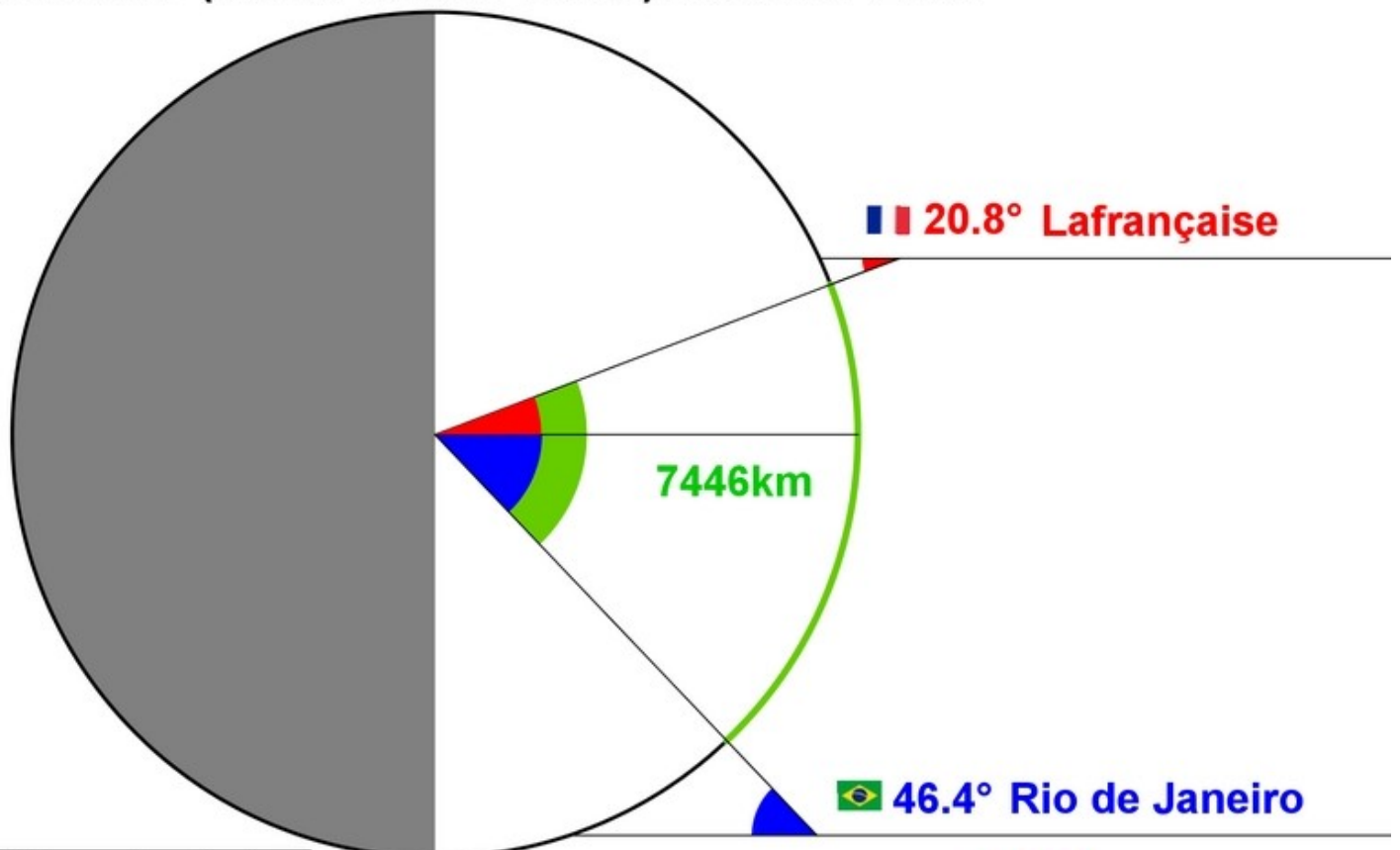


Flag	City	Country	School	Latitude (°) +N/-S	Longitude (°) +E/-W
	Rio de Janeiro	Brazil	Centro Educacional Nosso Mundo	-22.890	-43.317

Date	Gnomon	Shadow	Angle
03 June 2019	100.0cm	-82.0cm	-39.4°
07 June 2019	100.0cm	-84.0cm	-40.0°
10 June 2019	100.0cm	-84.0cm	-40.0°
11 June 2019	100cm	-84cm	-40°
12 June 2019	100.0cm	-86.0cm	-40.7°
13 June 2019	100cm	-84cm	-40°
14 June 2019	20.0cm	-21.0cm	-46.4°
17 June 2019	20.0cm	-20.5cm	-45.7°
18 June 2019	90.0cm	-92.0cm	-45.6°
19 June 2019	20.0cm	-20.5cm	-45.7°
24 June 2019	20cm	-20cm	-45°
25 June 2019	20cm	-20cm	-45°
28 June 2019	20cm	-20cm	-45°
29 June 2019	20cm	-20cm	-45°

14/06/2019 (Lafrançaise-France) Latitude: 44.127°

14/06/2019 (Rio de Janeiro-Brazil) Latitude: -22.89°



Distance	Angle
circumference	360°
7446km	20.8°+46.4°

$$\text{circumference} = \frac{360^\circ \times 7446\text{km}}{20.8^\circ + 46.4^\circ} = 39889 \text{ km}$$








# Rio de Janeiro Prefeitura, Brazil

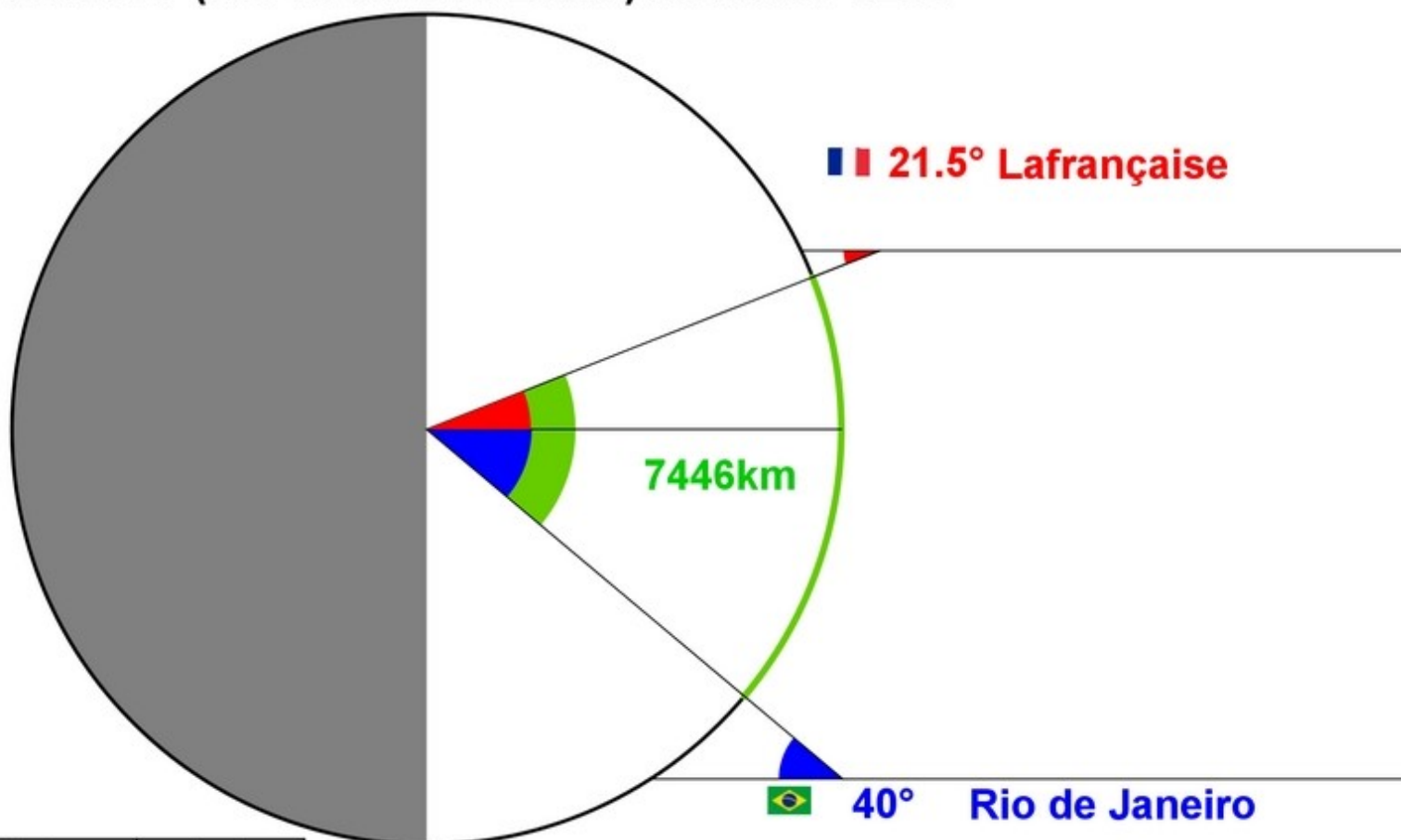


Flag	City	Country	School	Latitude (°) +N/-S	Longitude (°) +E/-W
	Rio de Janeiro	Brazil	Prefeitura	-22.911	-43.206

Date	Gnomon	Shadow	Angle
06 June 2019	600cm	-440cm	-36.3°

07/06/2019 (Lafrançaise-France) Latitude: 44.127°

07/06/2019 (Rio de Janeiro-Brazil) Latitude: -22.89°



Distance	Angle
circumference	360°
7446km	21.5°+40°

$$\text{circumference} = \frac{360^\circ \times 7446\text{km}}{21.5^\circ + 40^\circ} = 43586 \text{ km}$$





# Sohag, Egypt

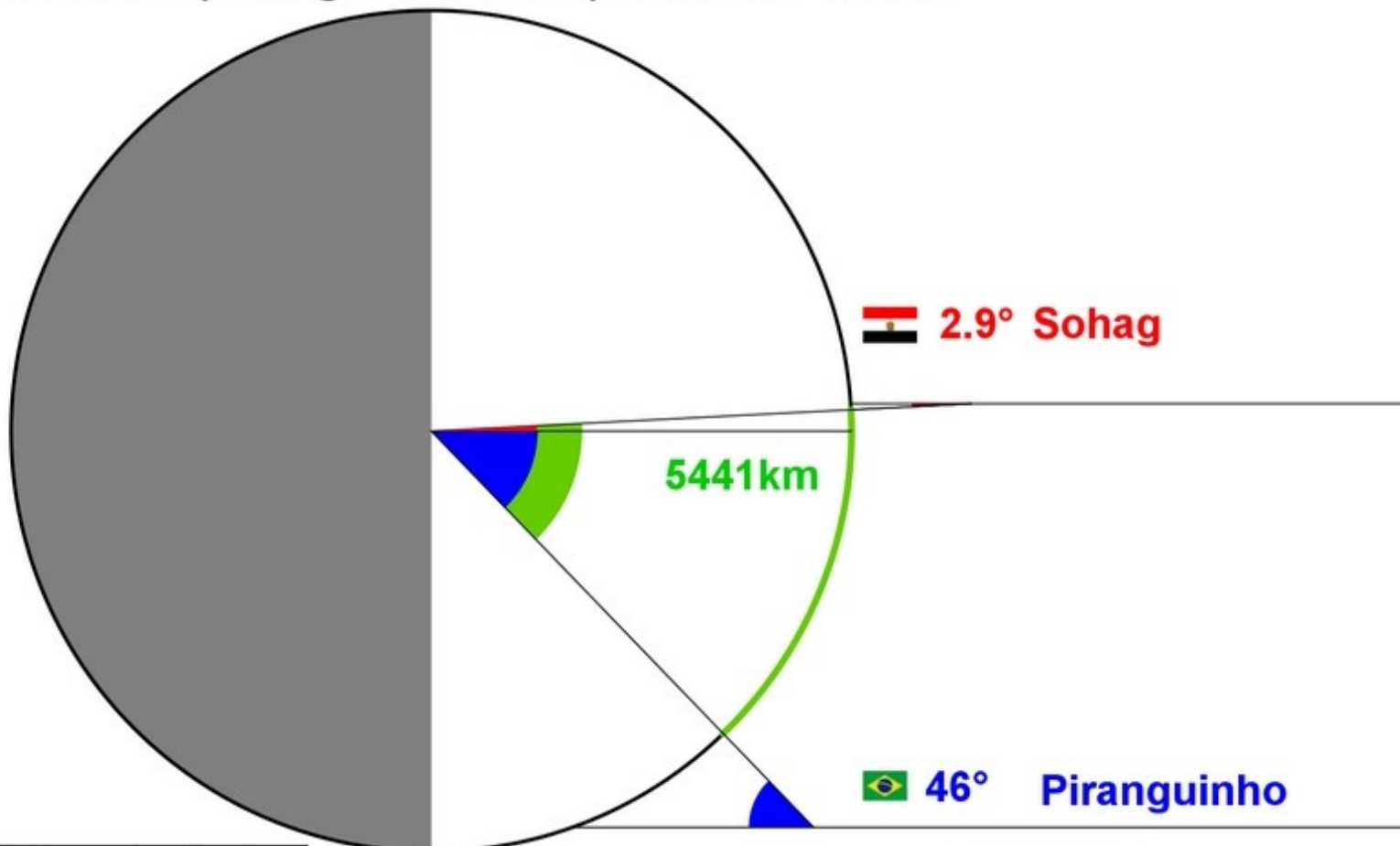


Flag	City	Country	School	Latitude (°) +N/-S	Longitude (°) +E/-W
	Sohag	Egypt		26.559	31.696

Date	Gnomon	Shadow	Angle
22 June 2019	24cm	1.2cm	2.9°

**22/06/2019 (Sohag-Egypt) Latitude: 26.559°**

**22/06/2019 (Piranguinho-Brazil) Latitude: -22.411°**



 **2.9° Sohag**

 **46° Piranguinho**

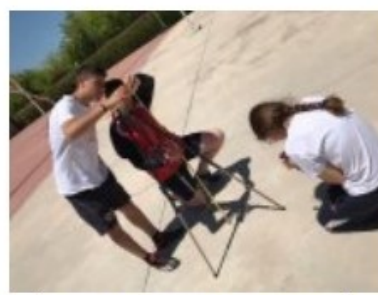
$$\text{circumference} = \frac{360^\circ \times 5441\text{km}}{2.9^\circ + 46^\circ} = 40056 \text{ km}$$


Distance	Angle
circumference	360°
5441km	2.9° + 46°





# Úbeda, Spain

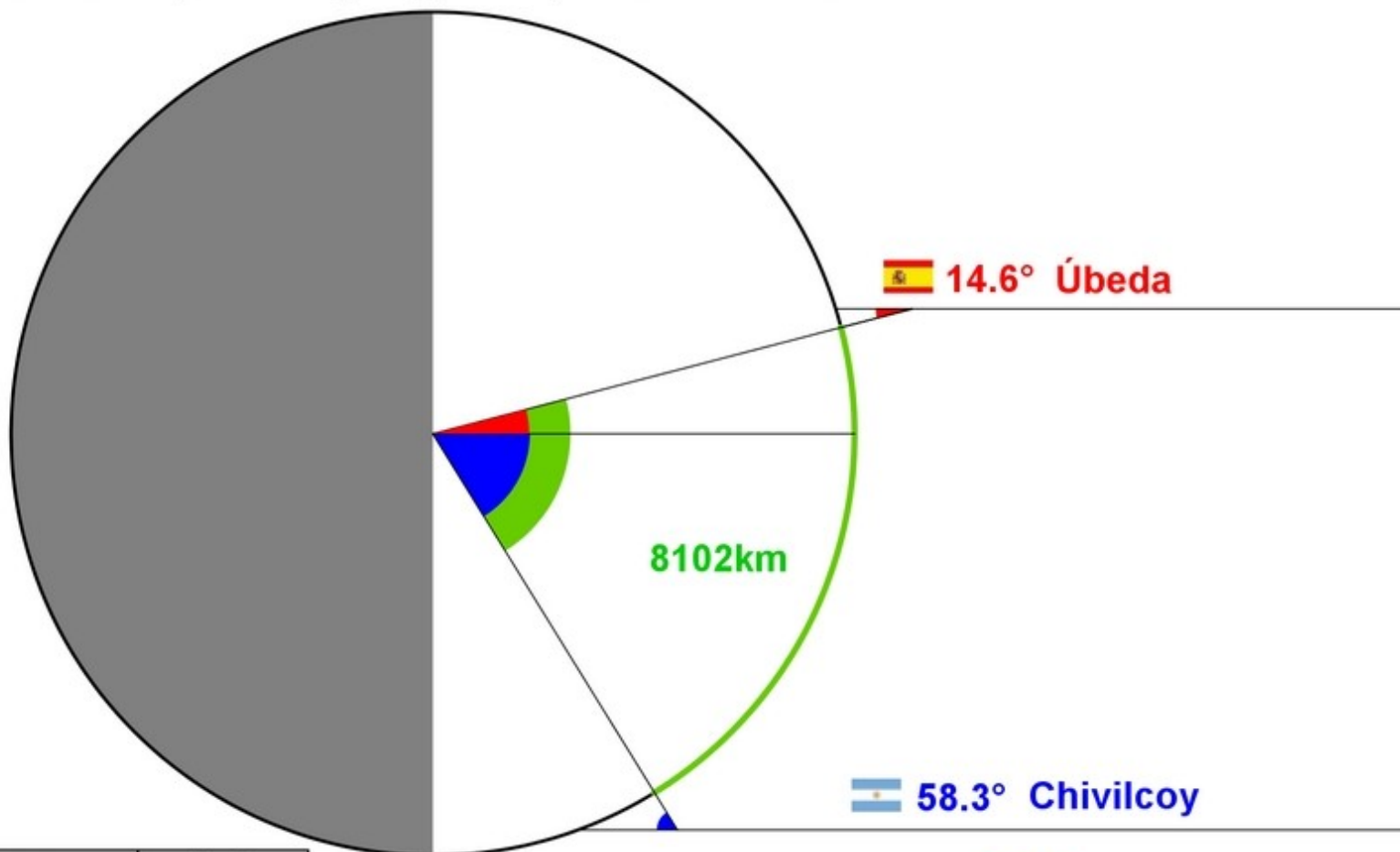


Flag	City	Country	School	Latitude (°) +N/-S	Longitude (°) +E/-W
	Úbeda	Spain	Colegio Salesiano Santo Domingo Savio	38.017	-3.367

Date	Gnomon	Shadow	Angle
17 June 2019	119.0cm	23.0cm	10.9°
18 June 2019	120.0cm	31.6cm	14.8°
19 June 2019	120.0cm	31.5cm	14.7°
20 June 2019	120.0cm	31.3cm	14.6°
21 June 2019	120.1cm	31.2cm	14.6°
23 June 2019	84.1cm	22.1cm	14.7°

20/06/2019 (Úbeda-Spain) Latitude: 38.017°

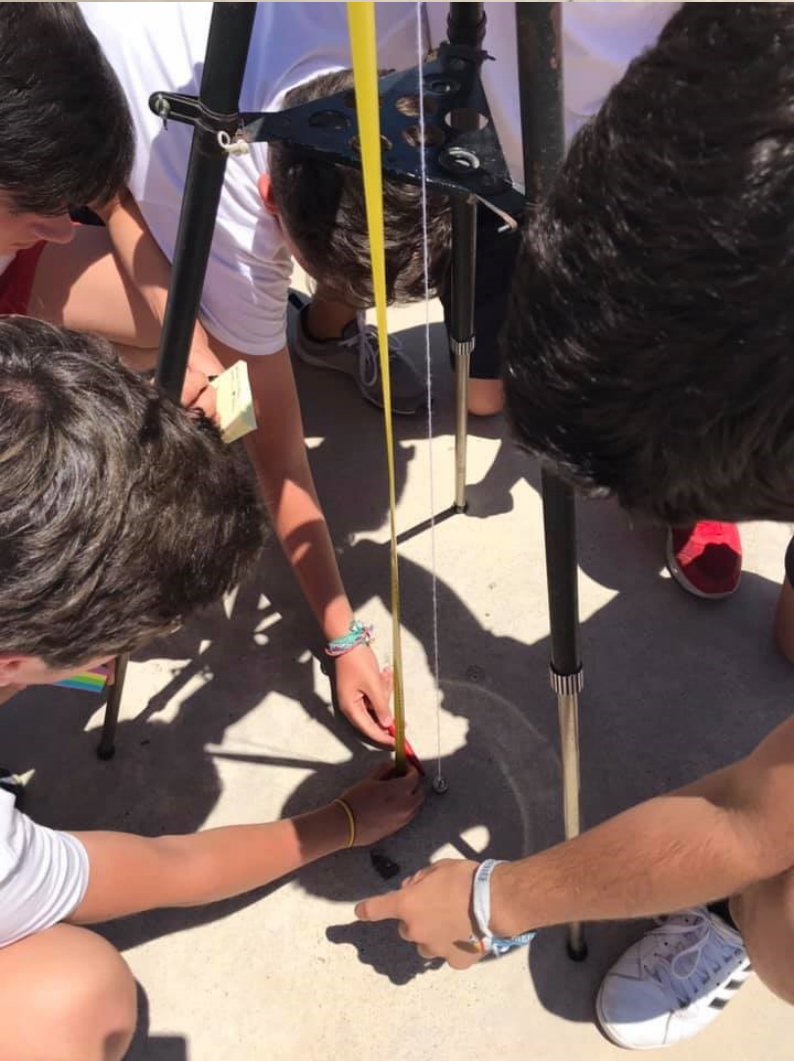
20/06/2019 (Chivilcoy-Argentina) Latitude: -34.911°



$$\text{circumference} = \frac{360^\circ \times 8102\text{km}}{14.6^\circ + 58.3^\circ} = 40010 \text{ km}$$

Distance	Angle
circumference	360°
8102km	14.6° + 58.3°





# Yamunanagar, India

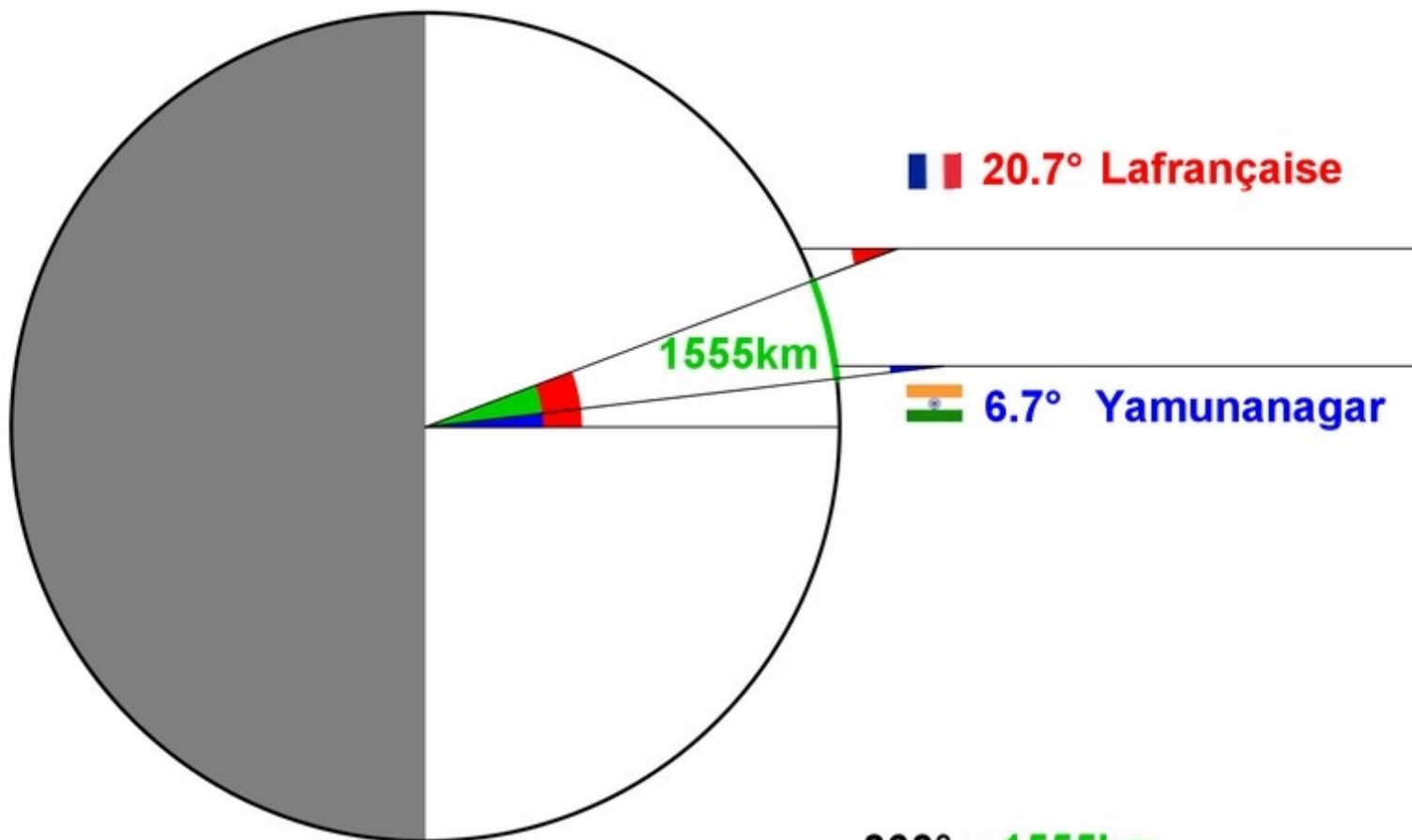


Flag	City	Country	School	Latitude (°) +N/-S	Longitude (°) +E/-W
	Yamunanagar	India	C V Raman Science Club	30.133	77.283

Date	Gnomon	Shadow	Angle
21 June 2019	27.9cm	3.3cm	6.7°
22 June 2019	33cm	3.9cm	6.7°
24 June 2019	44cm	5.2cm	6.7°

**21/06/2019 (Lafrançaise-France) Latitude: 44.127°**

**21/06/2019 (Yamunanagar-India) Latitude: 30.133°**



$$\text{circumference} = \frac{360^\circ \times 1555\text{km}}{20.7^\circ - 6.7^\circ} = 39986 \text{ km}$$

Distance	Angle
circumference	360°
1555km	20.7° - 6.7°







