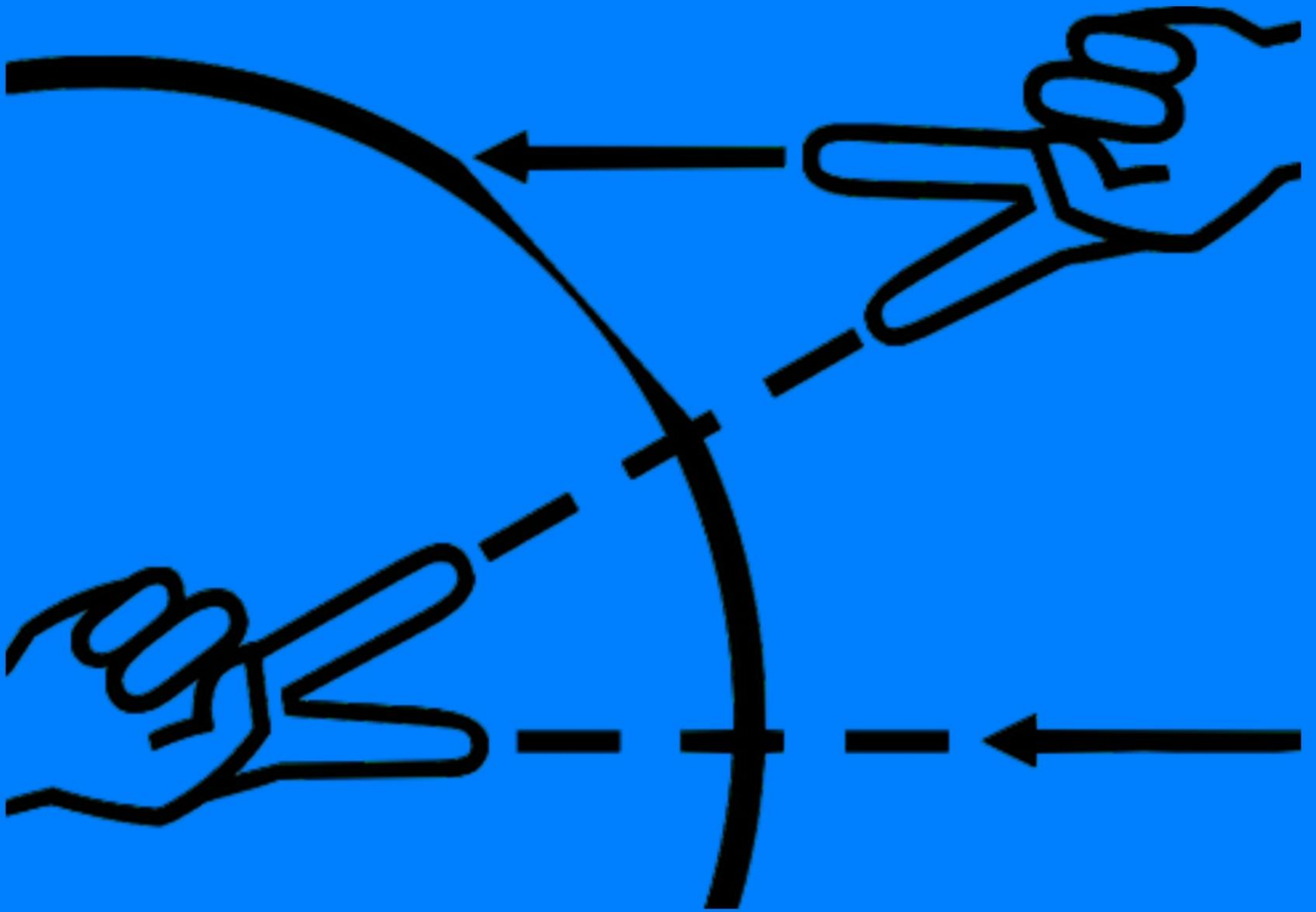


# Eratosthenes



September 2017

**3 Continents**

**12 Countries**

**41 Schools**

**120 Measures**

## **ARGENTINA (7)**

Anisacate, Buenos Aires (2), Chivilcoy,  
Pergamino, Rio Cuarto (2)

## **BRAZIL (7)**

Andarai, Itajubá, Maricá, Piranguinho, Rio de Janeiro (3)

## **CROATIA (1)**

Brštanovo

## **COLOMBIA (6)**

Guarne, Medellín (4), Popayan

## **ECUADOR (2)**

Lago San Pablo, Quitsato

## **FRANCE (2)**

Cernay, Lafrançaise

## **GREECE (7)**

Aigio, Andritsaina, Athens, Ilion, Ioannina,  
Petrroupoli, Piraeus

## **INDIA (2)**

Hyderabad, Yamunanagar

## **ITALY (2)**

Bologna, Marina di Carrara

## **MALAYSIA (1)**

Kuantan

## **ROMANIA (3)**

Busteni, Mărgineni, Râmnicu Vâlcea

## **SPAIN (1)**

Úbeda

| Flag                                                                               | City           | Country   | School                                     | Latitude (°)<br>+N/-S | Longitude (°)<br>+E/-W |
|------------------------------------------------------------------------------------|----------------|-----------|--------------------------------------------|-----------------------|------------------------|
|    | Aigio          | Greece    | 1st High School of Aigio                   | 38.252                | 22.079                 |
|    | Alta Gracia    | Argentina | Fundación Caminos de Anisacate             | -31.659               | -64.417                |
|    | Andaraí        | Brazil    | Clube de Astronomia do Rio de Janeiro      | -22.928               | -43.258                |
|    | Andritsaina    | Greece    | Gymnasio Andritsainas                      | 34.484                | 21.909                 |
|    | Athens         | Greece    | Experimental College Agion Anargyron       | 38.027                | 23.726                 |
|    | Bologna        | Italy     | IC9 "il Guercino"                          | 44.468                | 11.384                 |
|    | Brštanovo      | Croatia   | Osnovna škola kneza Branimira              | 43.658                | 16.415                 |
|   | Buenos Aires   | Argentina | Escuela Educación Secundaria N° 48 - Lanús | -34.734               | -58.399                |
|  | Buenos Aires   | Argentina | Instituto Mario Madeddu                    | -34.736               | -58.431                |
|  | Busteni        | Romania   | Colegiul Ion Kalinderu                     | 45.416                | 25.535                 |
|  | Cernay         | France    | Collège René Cassin                        | 47.814                | 7.183                  |
|  | Chivilcoy      | Argentina | Parque Cielos del Sur                      | -34.911               | -60.014                |
|  | Guarne         | Colombia  | Grupo Astrofanáticos                       | 6.274                 | -75.449                |
|  | Hyderabad      | India     | Space Adhyaan                              | 17.385                | 78.487                 |
|  | Ilion          | Greece    | 11th JuniorHigh School of Ilion            | 38.033                | 23.697                 |
|  | Ioannina       | Greece    | Experimental College                       | 39.666                | 20.845                 |
|  | Lago San Pablo | Ecuador   |                                            | 0.206                 | -78.203                |
|  | Itajubá        | Brazil    | Universidade Federal de Itajubá            | -22.415               | -45.449                |
|  | Kuantan        | Malaysia  | SMK St Thomas                              | 3.817                 | 103.333                |
|  | Lafrançaise    | France    | Collège Antonin Perbosc                    | 44.127                | 1.237                  |

| Flag                                                                               | City              | Country   | School                                | Latitude (°)<br>+N/-S | Longitude (°)<br>+E/-W |
|------------------------------------------------------------------------------------|-------------------|-----------|---------------------------------------|-----------------------|------------------------|
|    | Mărgineni         | Romania   | Gh. Popescu School                    | 44.533                | 24.554                 |
|    | Maricá            | Brazil    | Grupo 84 Cidade de Maricá             | -22.919               | -42.817                |
|    | Marina di Carrara | Italy     | M Buonarroti primary school           | 44.045                | 10.031                 |
|    | Medellín          | Colombia  | I.E. Ciudadela las Americas           | 6.309                 | -75.575                |
|    | Medellín          | Colombia  | I.E. el Corazón                       | 6.247                 | -75.629                |
|    | Medellín          | Colombia  | I.E. Javiera Londoño                  | 6.249                 | -75.560                |
|    | Medellín          | Colombia  | Universidad de Antioquia              | 6.267                 | -75.569                |
|   | Pergamino         | Argentina |                                       | -33.923               | -60.573                |
|  | Petroupoli        | Greece    | 4o Junior High School                 | 38.036                | 23.674                 |
|  | Piraeus           | Greece    | 2nd Junior High School of Korydallos  | 37.977                | 23.655                 |
|  | Piranguinho       | Brazil    | Universidade Federal de Itajubá       | -22.411               | -45.535                |
|  | Popayan           | Colombia  | I.E. Gabriela Mistral                 | 2.471                 | -76.579                |
|  | Quitsato          | Ecuador   | La Mitad del Mundo Reloj Solar        | 0,000                 | -78.175                |
|  | Râmnicu Vâlcea    | Romania   | S.G. Nr4 Gradinita Dumbrava Minuata   | 45.093                | 24.358                 |
|  | Rio Cuarto        | Argentina | Colegio Concordia                     | -33.149               | -64.351                |
|  | Rio Cuarto        | Argentina | IPEM No 79 "Ing. Renato de Marco"     | -33.151               | -64.341                |
|  | Rio de Janeiro    | Brazil    | Conselho Estadual de Educação         | -22.881               | -43.382                |
|  | Rio de Janeiro    | Brazil    | Centro Educacional Nosso Mundo        | -22.890               | -43.317                |
|  | Rio de Janeiro    | Brazil    | Escola Municipal Bento Ribeiro, Méier | -22.904               | -43.280                |
|  | Úbeda             | Spain     | Colegio Salesiano Santo Domingo Savio | 38.017                | -3.367                 |
|  | Yamunanagar       | India     | C V Raman Science Club                | 30.117                | 77.250                 |

# Aigio, Greece

September 2017

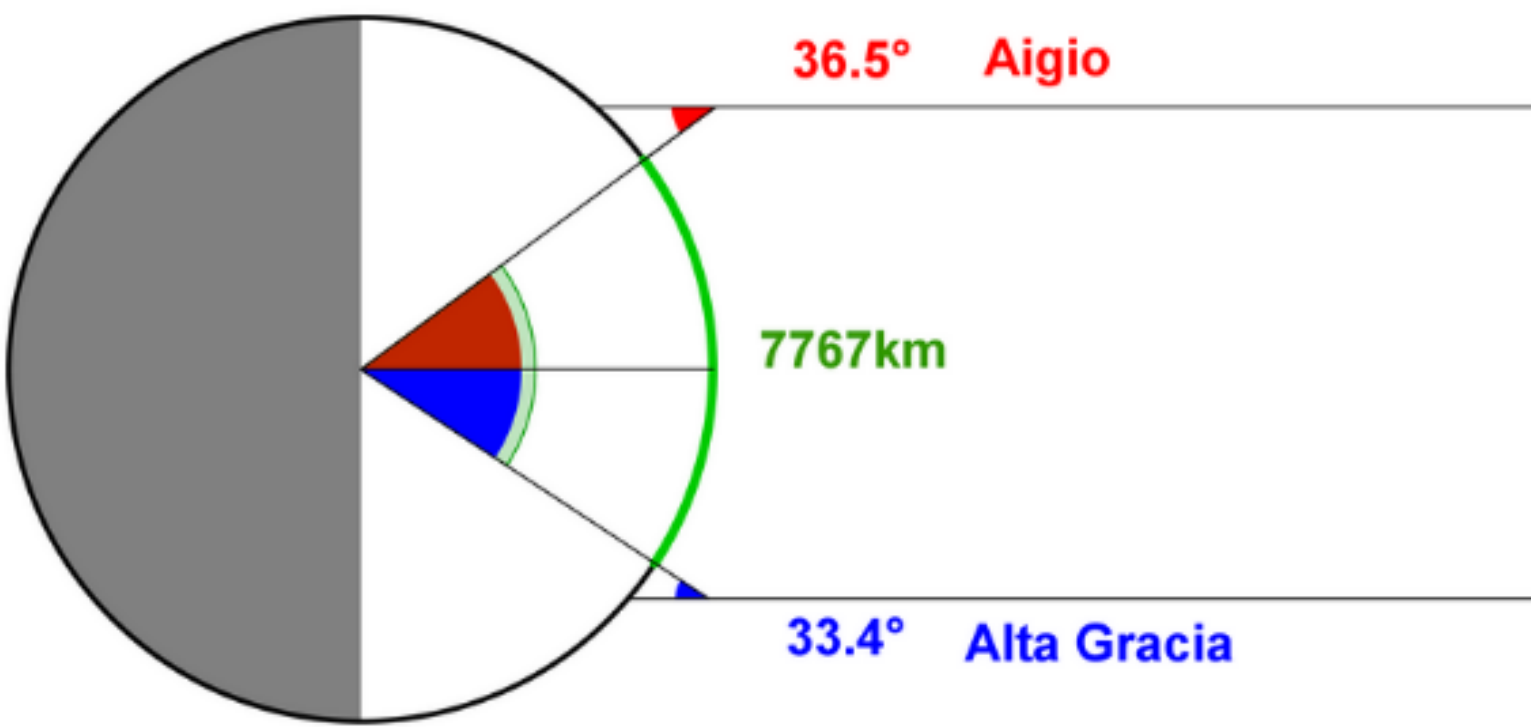


| Flag                                                                             | City  | Country | School                   | Latitude (°) +N/-S | Longitude (°) +E/-W |
|----------------------------------------------------------------------------------|-------|---------|--------------------------|--------------------|---------------------|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

| Date         | Gnomon | Shadow | Angle  |
|--------------|--------|--------|--------|
| 12 September | 50 cm  | 34 cm  | 34.2 ° |
| 18 September | 50 cm  | 37 cm  | 36.5 ° |

18/9/2017 (Aigio-Greece) Latitude: 38.252°

18/09/2017 (Alta Gracia-Argentina) Latitude: -31.659°



circumference =  $\frac{360^\circ \times 7767\text{km}}{36.5^\circ + 33.4^\circ} = 40002 \text{ km}$



# Alta Gracia, Argentina

September 2017

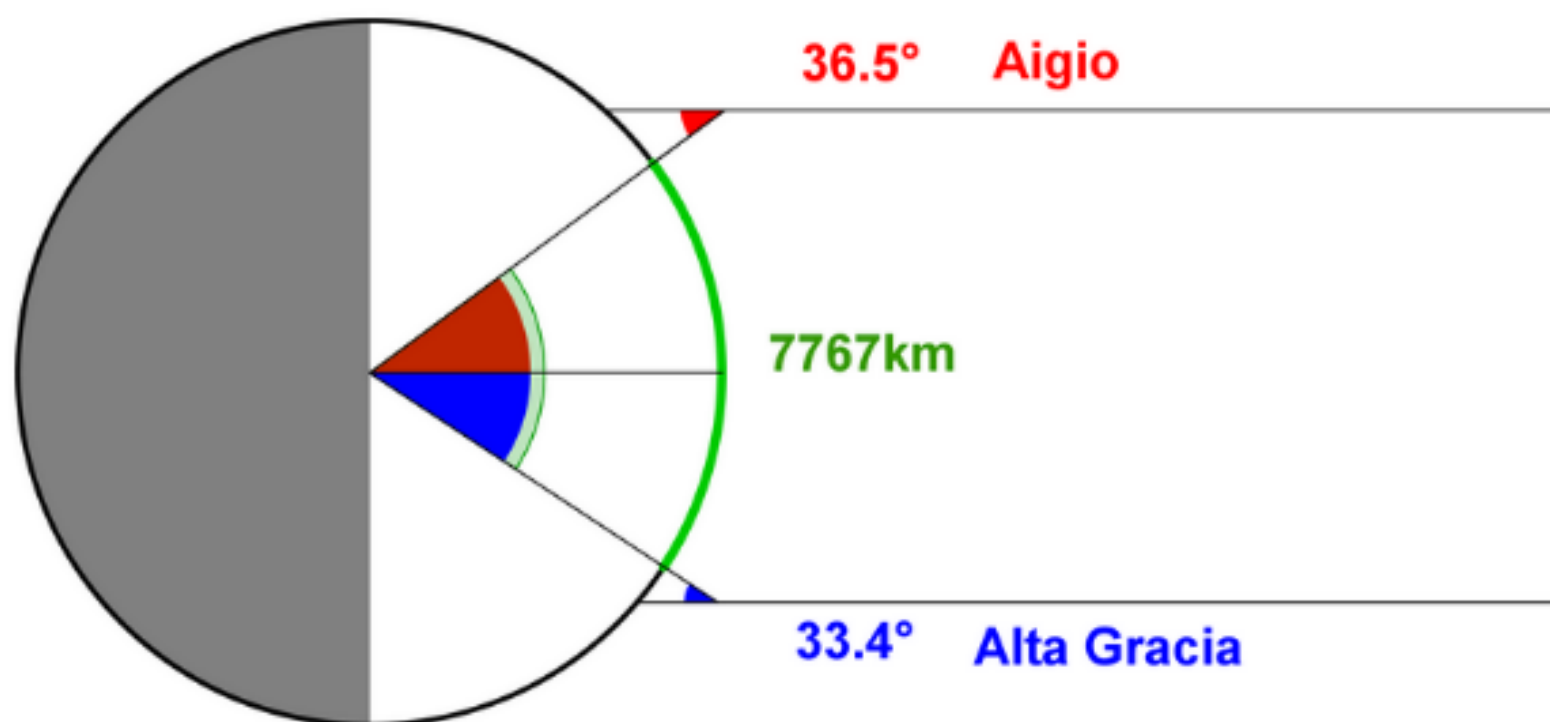


| Flag                                                                             | City        | Country   | School                         | Latitude (°) +N/-S | Longitude (°) +E/-W |
|----------------------------------------------------------------------------------|-------------|-----------|--------------------------------|--------------------|---------------------|
|  | Alta Gracia | Argentina | Fundación Caminos de Anisacate | -31.659            | -64.417             |

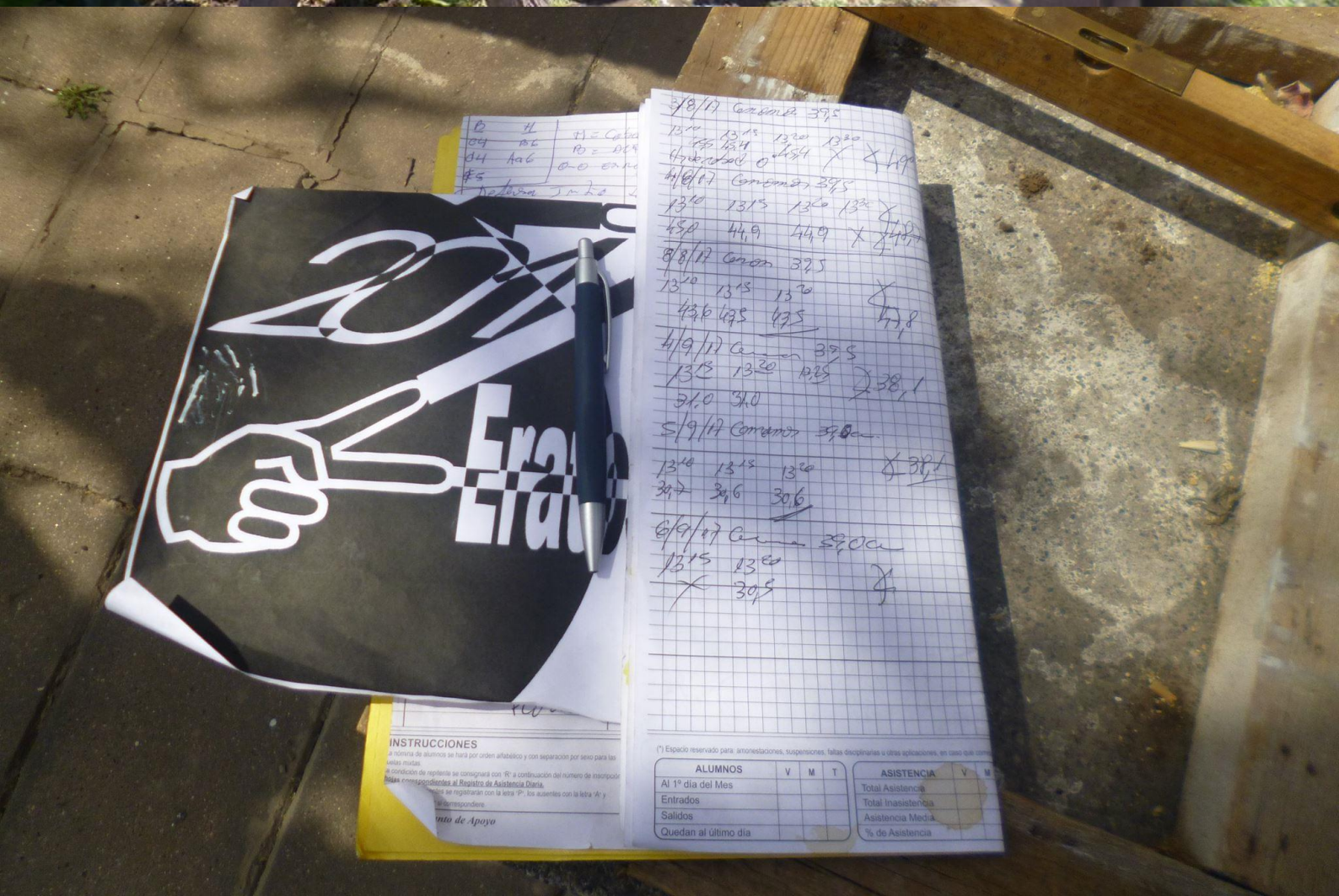
| Date         | Gnomon  | Shadow   | Angle   |
|--------------|---------|----------|---------|
| 04 September | 39.5 cm | -31 cm   | -38.1 ° |
| 05 September | 39.5 cm | -30.6 cm | -38.1 ° |
| 06 September | 39.5 cm | -30.4 cm | -37.9 ° |
| 07 September | 39.5 cm | -30 cm   | -37.6 ° |
| 11 September | 39 cm   | 28.5 cm  | -36.2 ° |
| 12 September | 39 cm   | -28.2 cm | -35.9 ° |
| 13 September | 39 cm   | -27.6 cm | -35.3 ° |
| 18 September | 39 cm   | -25.7 cm | -33.4 ° |
| 19 September | 39 cm   | -25.4 cm | -33.1 ° |
| 20 September | 39 cm   | -25 cm   | -32.7 ° |
| 21 September | 39 cm   | -24.5 cm | -32.1 ° |
| 22 September | 39 cm   | -24 cm   | -31.6 ° |
| 25 September | 39 cm   | -23 cm   | -30.5 ° |

**18/9/2017 (Aigio-Greece) Latitude: 38.252°**

**18/09/2017 (Alta Gracia-Argentina) Latitude: -31.659°**



$$\text{circumference} = \frac{360^\circ \times 7767\text{km}}{36.5^\circ + 33.4^\circ} = 40002 \text{ km}$$



# Andaraí, Brazil

September 2017

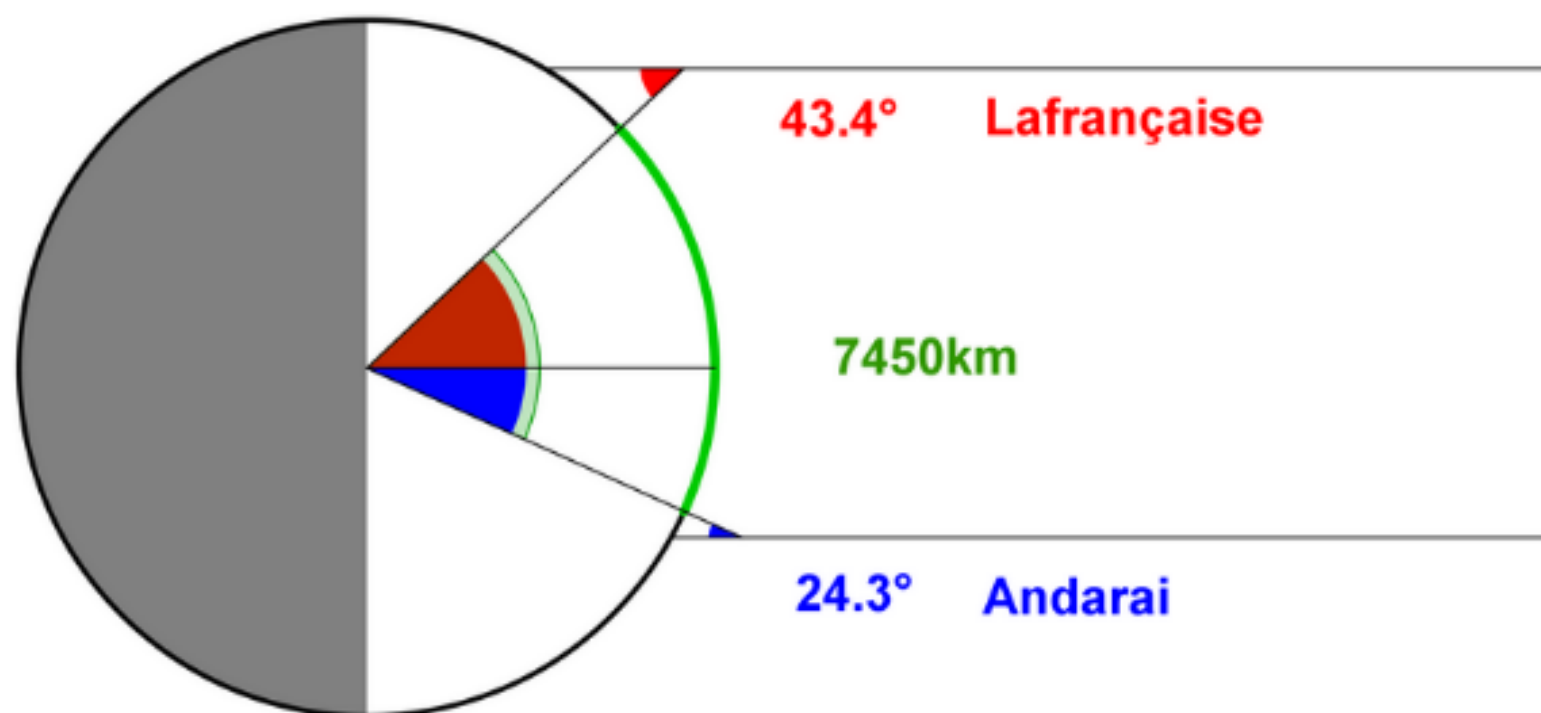


| Flag                                                                             | City    | Country | School                                | Latitude (°) +N/-S | Longitude (°) +E/-W |
|----------------------------------------------------------------------------------|---------|---------|---------------------------------------|--------------------|-----------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

| Date         | Gnomon | Shadow   | Angle   |
|--------------|--------|----------|---------|
| 21 September | 101 cm | -45.5 cm | -24.3 ° |
| 22 September | 101 cm | -46.7 cm | -24.8 ° |
| 23 September | 28 cm  | -11.4 cm | -22.2 ° |
| 24 September | 28 cm  | -11 cm   | -21.4 ° |
| 25 September | 101 cm | -50 cm   | -26.3 ° |
| 27 September | 101 cm | -43 cm   | -23.1 ° |

**21/09/2017 (Lafrançaise-France) Latitude: 44.127°**

**21/09/2017 (Andarai-Brazil) Latitude: -22.928°**



$$\text{circumference} = \frac{360^\circ \times 7450\text{km}}{43.4^\circ + 24.3^\circ} = 39616 \text{ km}$$



# Andritsaina, Greece

September 2017

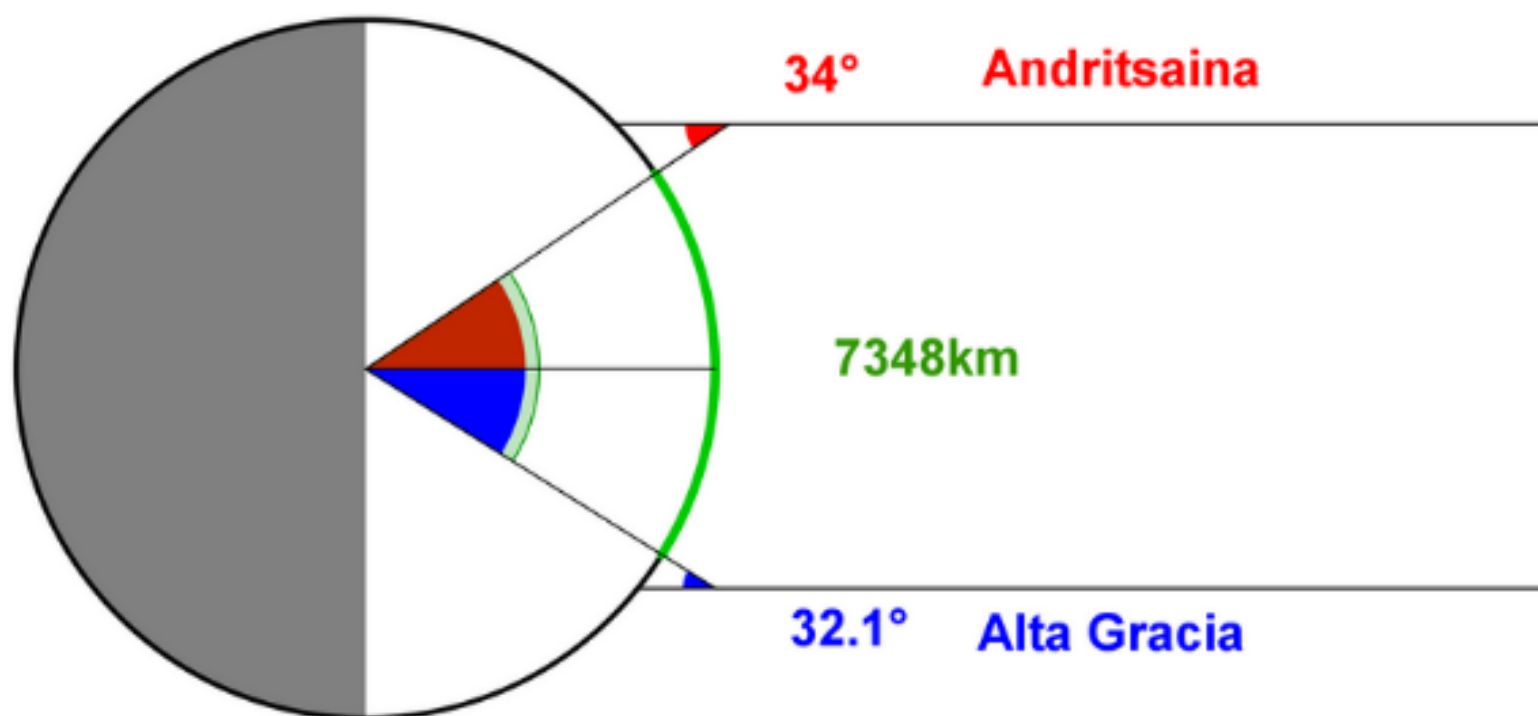


| Flag                                                                             | City        | Country | School                | Latitude (°) +N/-S | Longitude (°) +E/-W |
|----------------------------------------------------------------------------------|-------------|---------|-----------------------|--------------------|---------------------|
|  | Andritsaina | Greece  | Gymnasio Andritsainas | 34.484             | 21.909              |

| Date         | Gnomon | Shadow  | Angle |
|--------------|--------|---------|-------|
| 21 September | 100 cm | 67.5 cm | 34 °  |

**21/09/2017 (Andritsaina-Greece) Latitude: 34.484°**

**21/09/2017 (Alta Gracia-Argentina) Latitude: -31.659°**



$$\text{circumference} = \frac{360^\circ \times 7348\text{km}}{34^\circ + 32.1^\circ} = 40019 \text{ km}$$



# Athens, Greece

September 2017

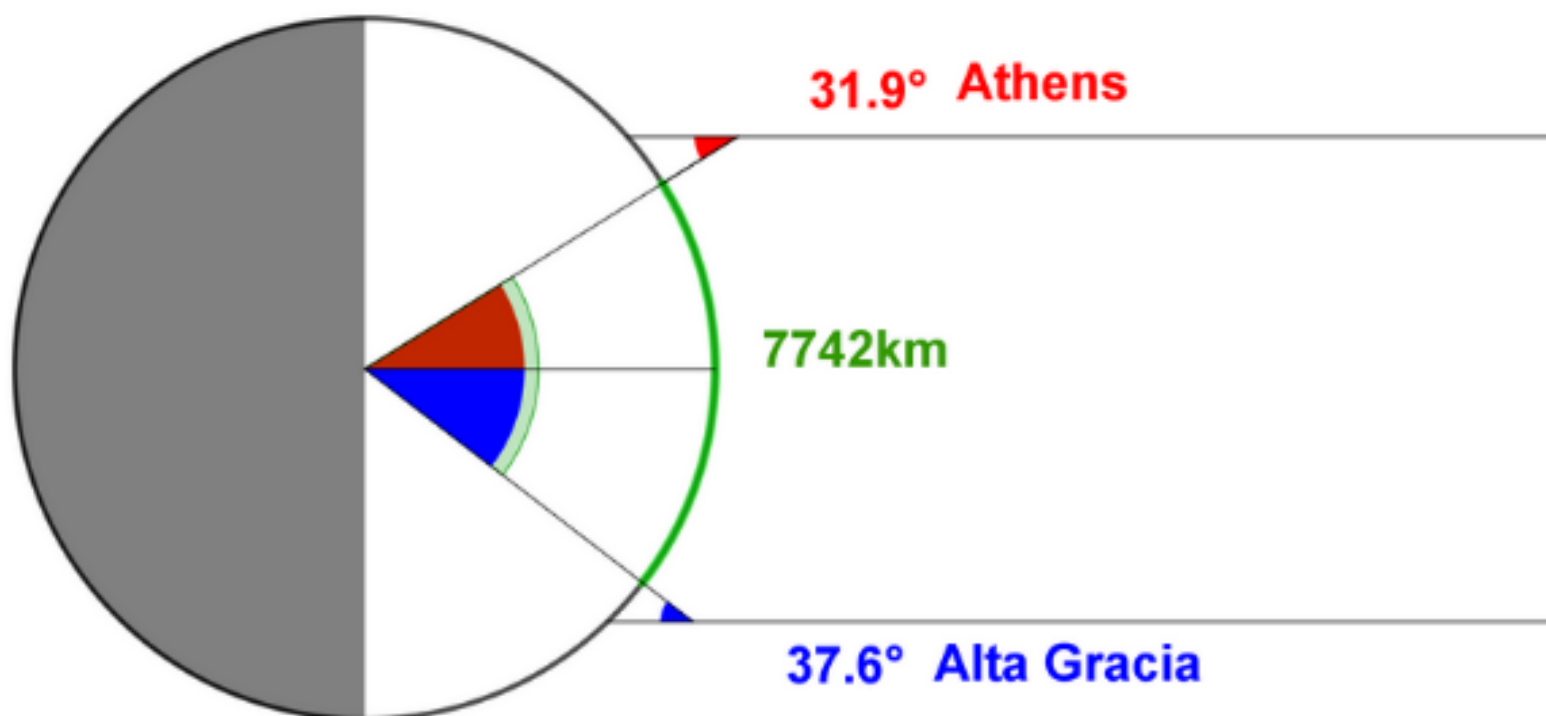


| Flag                                                                             | City   | Country | School                               | Latitude (°) +N/-S | Longitude (°) +E/-W |
|----------------------------------------------------------------------------------|--------|---------|--------------------------------------|--------------------|---------------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

| Date         | Gnomon | Shadow   | Angle  |
|--------------|--------|----------|--------|
| 06 September | 49 cm  | 30 cm    | 31.5 ° |
| 07 September | 49 cm  | 30.5 cm  | 31.9 ° |
| 08 September | 49 cm  | 31 cm    | 32.3 ° |
| 20 September | 244 cm | 186.5 cm | 37.4 ° |
| 22 September | 244 cm | 192 cm   | 37.9 ° |

**07/09/2017 (Athens-Greece) Latitude: 38.028°**

**07/09/2017 (Alta Gracia-Argentina) Latitude: -31.659°**



$$\text{circumference} = \frac{360^\circ \times 7742\text{km}}{31.9^\circ + 37.6^\circ} = 40102 \text{ km}$$

ΠΕΙΡΑΜΑΤΙΚΟ ΓΥΜΝΑΣΙΟ  
ΑΓΙΩΝ ΑΝΑΡΓΥΡΩΝ



# Bologna, Italy

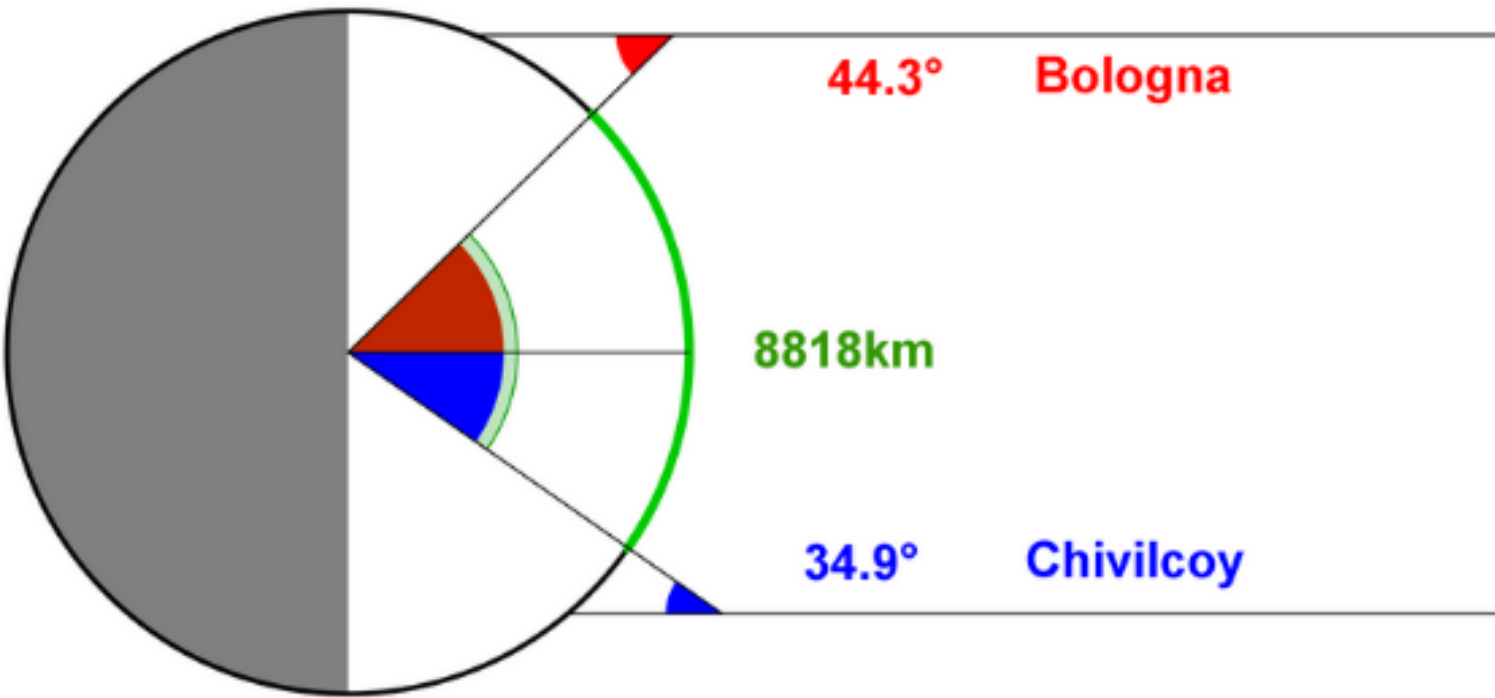
September 2017



| Flag                                                                             | City    | Country | School            | Latitude (°) +N/-S | Longitude (°) +E/-W |
|----------------------------------------------------------------------------------|---------|---------|-------------------|--------------------|---------------------|
|  | Bologna | Italy   | IC9 "il Guercino" | 44.468             | 11.384              |

| Date         | Gnomon | Shadow  | Angle  |
|--------------|--------|---------|--------|
| 22 September | 100 cm | 97.5 cm | 44.3 ° |

22/09/2017 (Bologna-Italy) Latitude: 44.459°  
22/09/2017 (Chivilcoy-Argentina) Latitude: -34.911°



circumference =  $\frac{360^\circ \times 8818\text{km}}{44.3^\circ + 34.9^\circ} = 40082 \text{ km}$



# Brštanovo, Croatia

September 2017

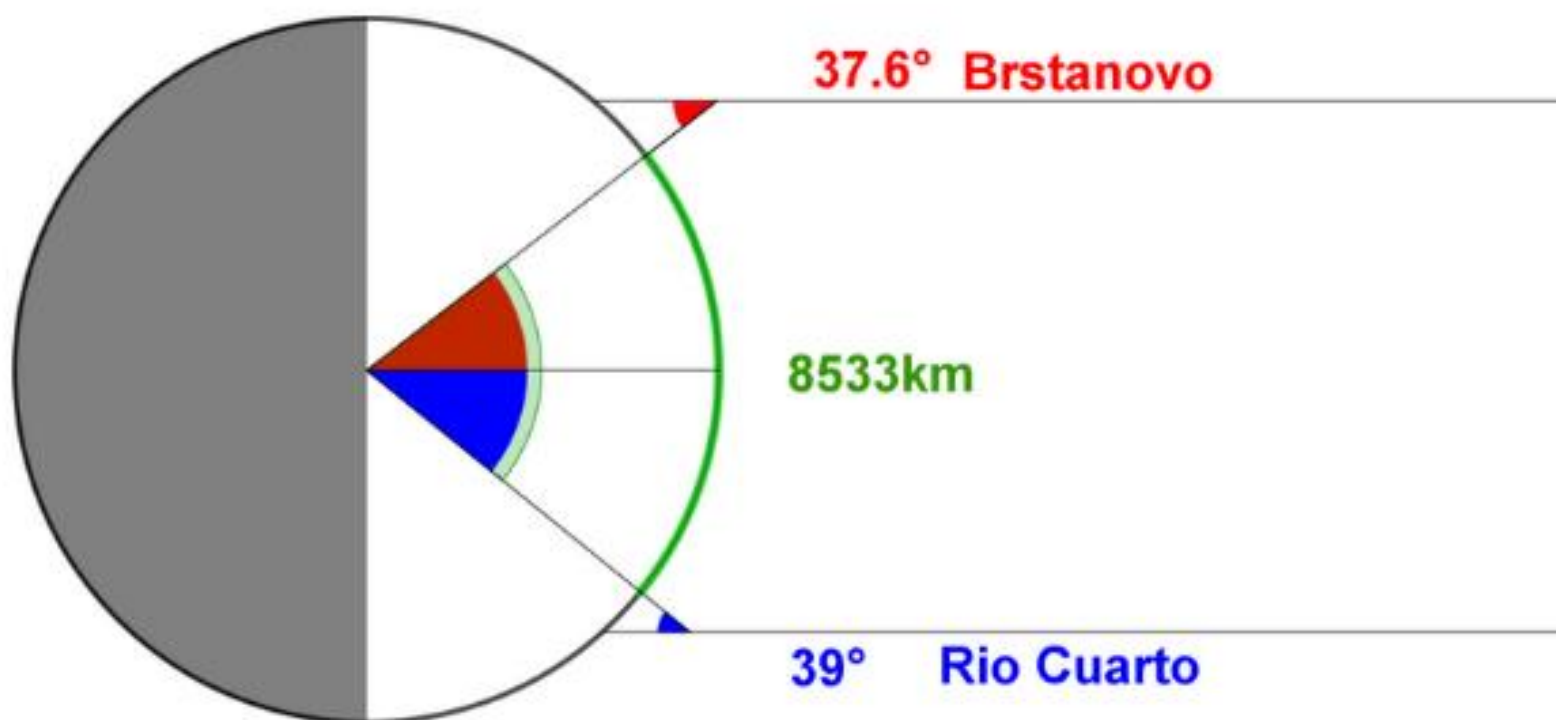


| Flag                                                                             | City      | Country | School                        | Latitude (°) +N/-S | Longitude (°) +E/-W |
|----------------------------------------------------------------------------------|-----------|---------|-------------------------------|--------------------|---------------------|
|  | Brštanovo | Croatia | Osnovna škola kneza Branimira | 43.658             | 16.415              |

| Date         | Gnomon | Shadow  | Angle  |
|--------------|--------|---------|--------|
| 06 September | 100 cm | 76.9 cm | 37.6 ° |
| 13 September | 100 cm | 84.4 cm | 40.2 ° |

06/09/2017 (Brstanovo-Croatia) Latitude: 43.658°

06/09/2017 (Rio Cuarto-Argentina) Latitude: -33.149°



$$\text{circumference} = \frac{360^\circ \times 8533\text{km}}{37.6^\circ + 39^\circ} = 40103 \text{ km}$$



# Buenos Aires 48, Argentina

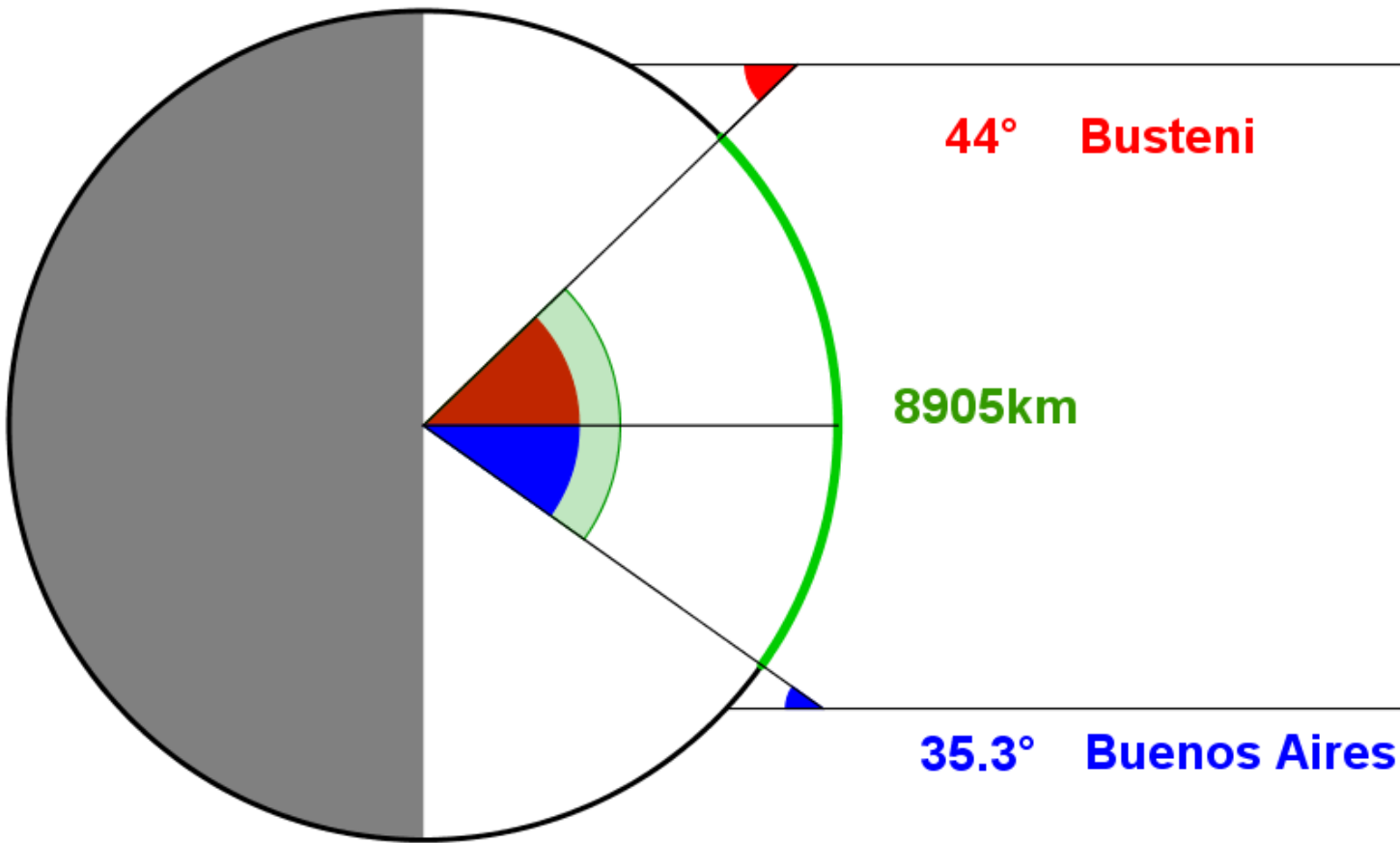
September 2017



| Flag                                                                             | City         | Country   | School                                     | Latitude (°)<br>+N/-S | Longitude (°)<br>+E/-W |
|----------------------------------------------------------------------------------|--------------|-----------|--------------------------------------------|-----------------------|------------------------|
|  | Buenos Aires | Argentina | Escuela Educación Secundaria N° 48 - Lanús | -34.734               | -58.399                |

| Date         | Gnomon | Shadow   | Angle   |
|--------------|--------|----------|---------|
| 19 September | 25 cm  | -17.7 cm | -35.3 ° |

19/09/2017 (Busteni-Romania) Latitude: 45.416°  
19/09/2017 (Buenos Aires-Argentina) Latitude: -34.734°



circumference =  $\frac{360^\circ \times 8905\text{km}}{44^\circ + 35.3^\circ} = 40426 \text{ km}$



# Buenos Aires IMM, Argentina

September 2017

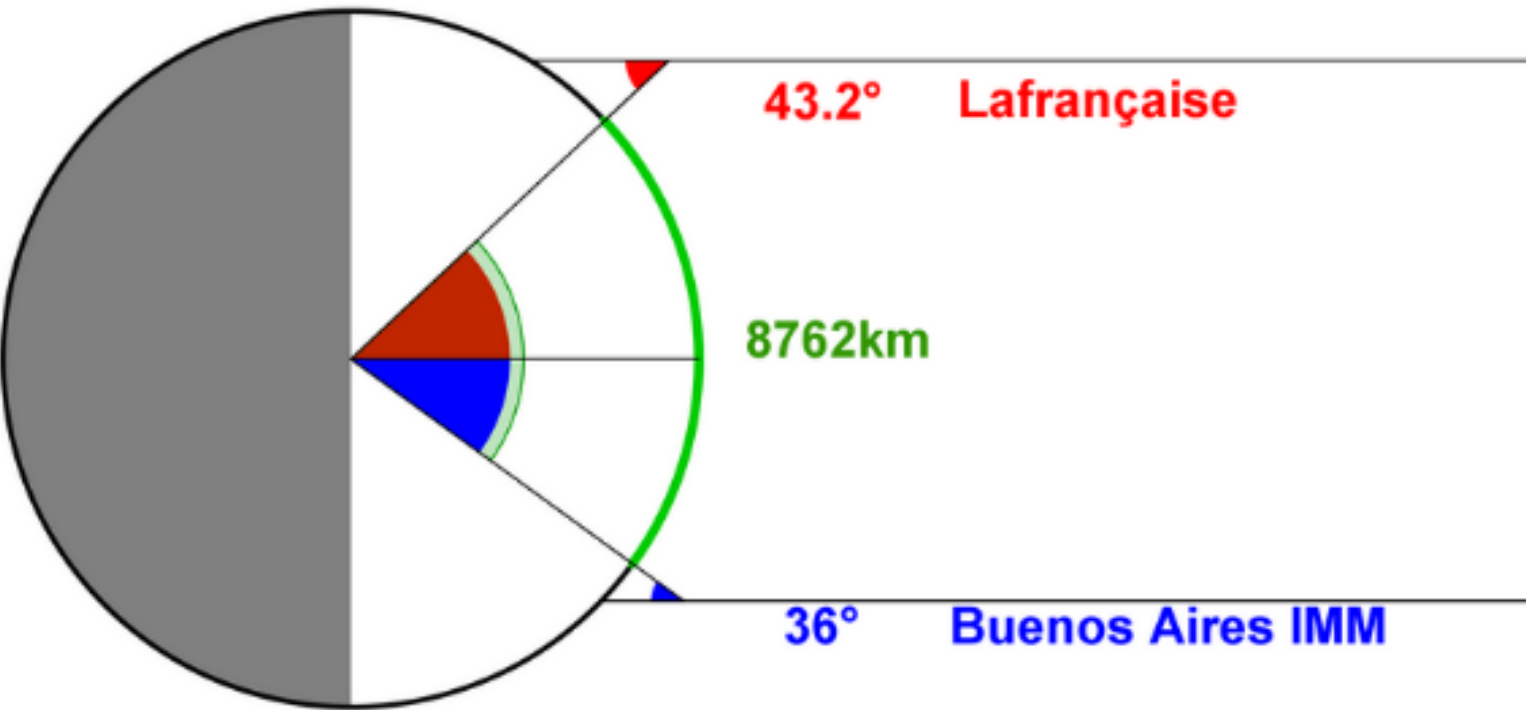


| Flag                                                                             | City         | Country   | School                  | Latitude (°) +N/-S | Longitude (°) +E/-W |
|----------------------------------------------------------------------------------|--------------|-----------|-------------------------|--------------------|---------------------|
|  | Buenos Aires | Argentina | Instituto Mario Madeddu | -34.736            | -58.431             |

| Date         | Gnomon  | Shadow   | Angle   |
|--------------|---------|----------|---------|
| 22 September | 22.3 cm | -16.2 cm | -36.0 ° |
| 27 September | 12.4 cm | -8.5 cm  | -34.4 ° |

22/09/2017 (Lafrançaise-France) Latitude: 44.127°

22/09/2017 (Buenos Aires IMM-Argentina) Latitude: -34.736°



circumference =  $\frac{360^\circ \times 8762\text{km}}{43.2^\circ + 36^\circ} = 39827 \text{ km}$



# Busteni, Romania

September 2017

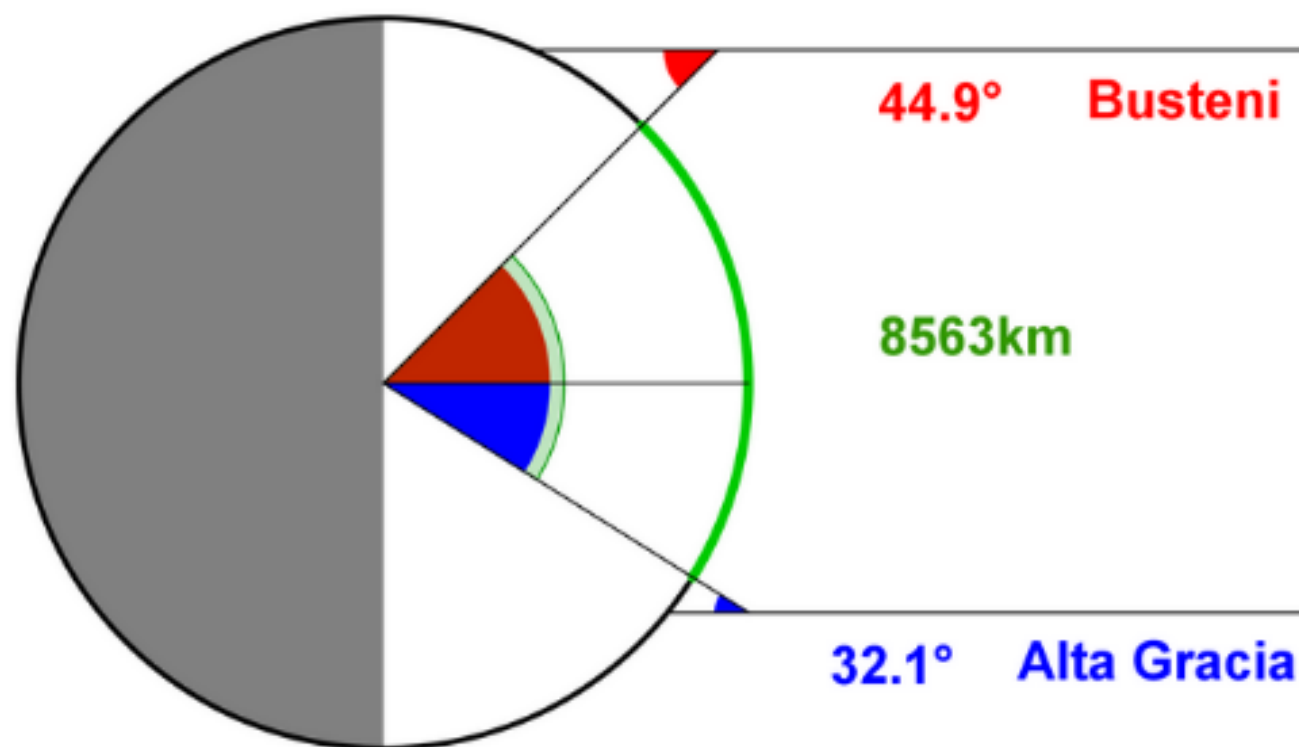


| Flag                                                                             | City    | Country | School                 | Latitude (°) +N/-S | Longitude (°) +E/-W |
|----------------------------------------------------------------------------------|---------|---------|------------------------|--------------------|---------------------|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

| Date         | Gnomon   | Shadow   | Angle  |
|--------------|----------|----------|--------|
| 14 September | 100 cm   | 90.3 cm  | 42.1 ° |
| 15 September | 100 cm   | 91.5 cm  | 42.5 ° |
| 18 September | 100.5 cm | 95.5 cm  | 43.5 ° |
| 19 September | 17.6 cm  | 17 cm    | 44.0 ° |
| 20 September | 100 cm   | 98.2 cm  | 44.5 ° |
| 21 September | 25 cm    | 24.9 cm  | 44.9 ° |
| 22 September | 25.2 cm  | 25.5 cm  | 45.3 ° |
| 25 September | 100 cm   | 105.3 cm | 46.5 ° |
| 27 September | 100 cm   | 108.3 cm | 47.3 ° |
| 28 September | 100 cm   | 109.9 cm | 47.7 ° |

**21/09/2017 (Busteni-Romania) Latitude: 45.416°**

**21/09/2017 (Alta Gracia-Argentina) Latitude: -31.659°**



$$\text{circumference} = \frac{360^\circ \times 8563\text{km}}{44.9^\circ + 32.1^\circ} = 40035 \text{ km}$$



# Cernay, France

September 2017

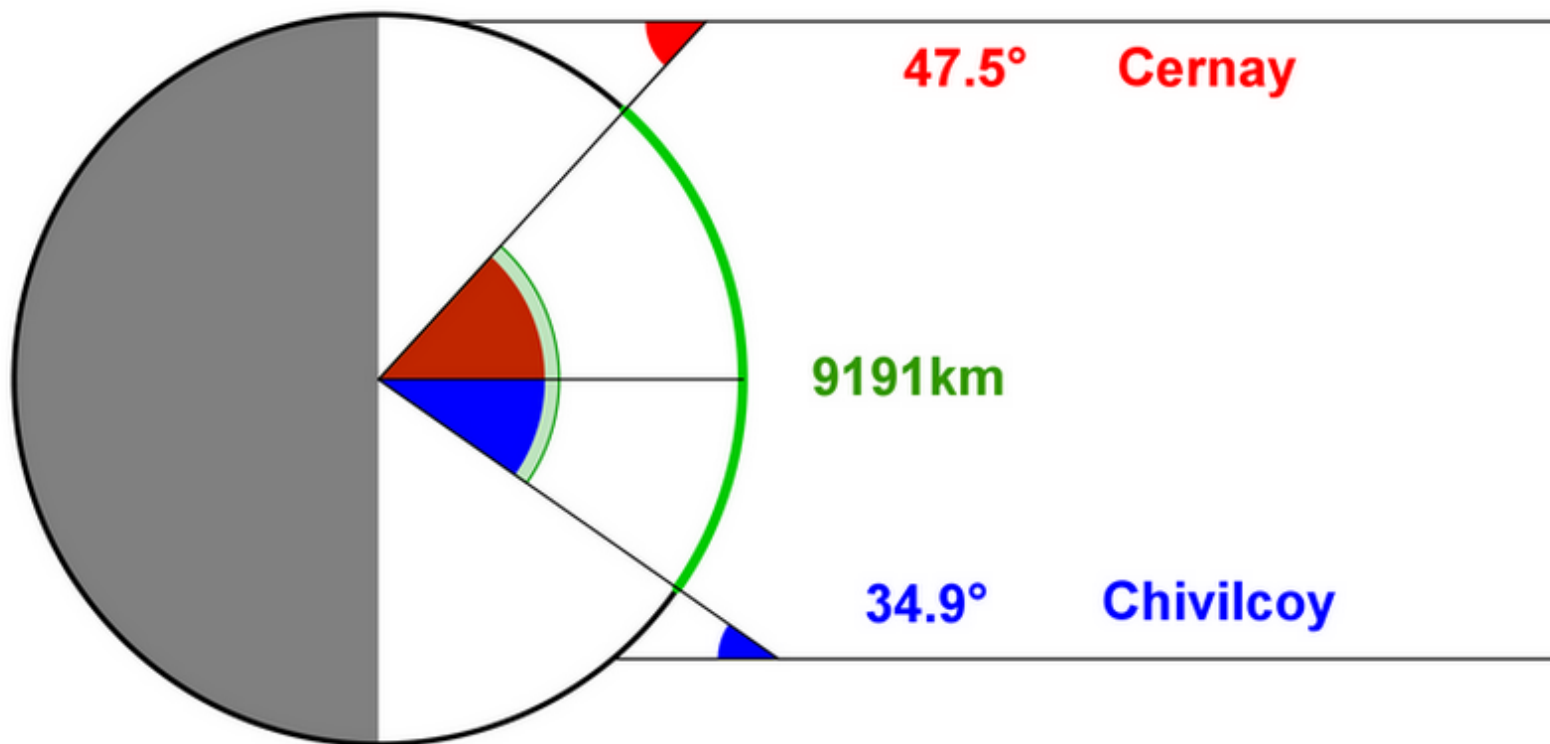


| Flag                                                                             | City   | Country | School              | Latitude (°) +N/-S | Longitude (°) +E/-W |
|----------------------------------------------------------------------------------|--------|---------|---------------------|--------------------|---------------------|
|  | Cernay | France  | Collège René Cassin | 47.814             | 7.183               |

| Date         | Gnomon   | Shadow | Angle  |
|--------------|----------|--------|--------|
| 22 September | 368.5 cm | 402 cm | 47.5 ° |

**22/09/2017 (Cernay-France) Latitude: 47.814°**

**22/09/2017 (Chivilcoy-Argentina) Latitude: -34.911°**



$$\text{circumference} = \frac{360^\circ \times 9191\text{km}}{47.5^\circ + 34.9^\circ} = 40155 \text{ km}$$



# Chivilcoy, Argentina

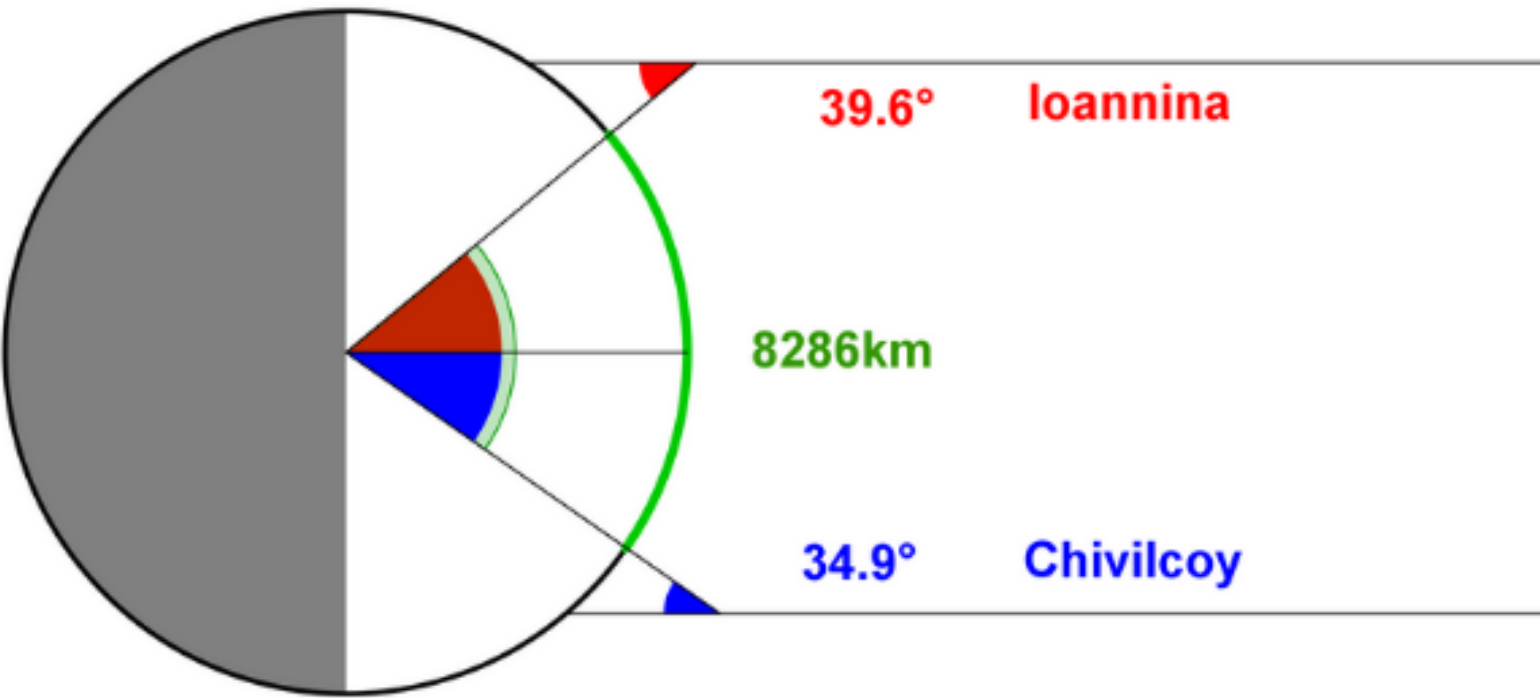
September 2017



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

| Date         | Gnomon | Shadow  | Angle   |
|--------------|--------|---------|---------|
| 22 September | 480 cm | -285 cm | -34.9 ° |

22/09/2017 (Ioannina-Greece) Latitude: 39.667°  
22/09/2017 (Chivilcoy-Argentina) Latitude: -34.911°



circumference =  $\frac{360^\circ \times 8286\text{km}}{39.6^\circ + 34.9^\circ} = 40040 \text{ km}$



# Guarne, Colombia

September 2017

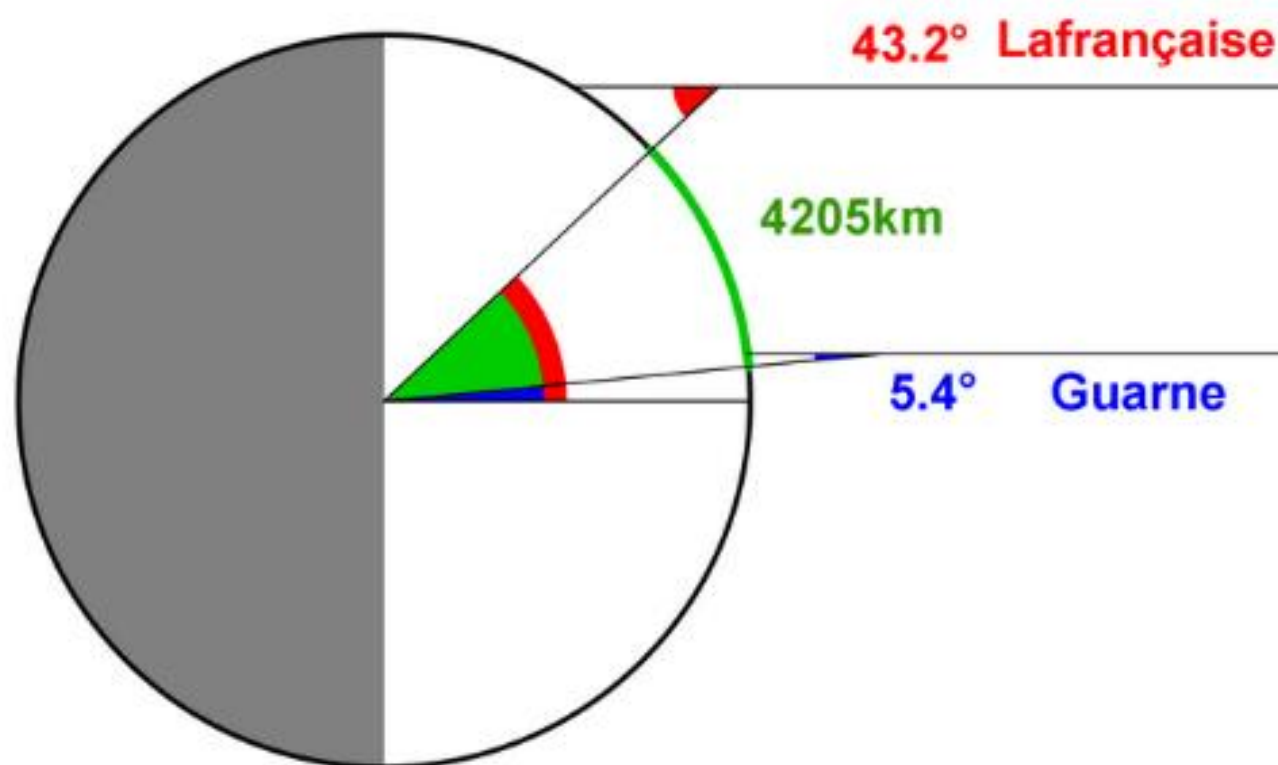


| Flag                                                                             | City   | Country  | School               | Latitude (°) +N/-S | Longitude (°) +E/-W |
|----------------------------------------------------------------------------------|--------|----------|----------------------|--------------------|---------------------|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

| Date         | Gnomon   | Shadow  | Angle |
|--------------|----------|---------|-------|
| 06 September | 64.8 cm  | 0 cm    | 0 °   |
| 14 September | 114.4 cm | 7.6 cm  | 3.8 ° |
| 18 September | 110.4 cm | 10.5 cm | 5.4 ° |
| 19 September | 64.8 cm  | 5.9 cm  | 5.2 ° |
| 20 September | 110.4 cm | 12 cm   | 6.1 ° |
| 21 September | 110.4 cm | 12.6 cm | 6.5 ° |
| 22 September | 64.8 cm  | 7.5 cm  | 6.6 ° |
| 25 September | 64.8 cm  | 8.8 cm  | 7.7 ° |

**18/09/2017 (Lafrançaise-France) Latitude: 44.127°**

**18/09/2017 (Guarne-Colombia) Latitude: 6.274°**



$$\text{circumference} = \frac{360^\circ \times 4205\text{km}}{43.2^\circ - 5.4^\circ} = 40048 \text{ km}$$



# Hyderabad, India

September 2017

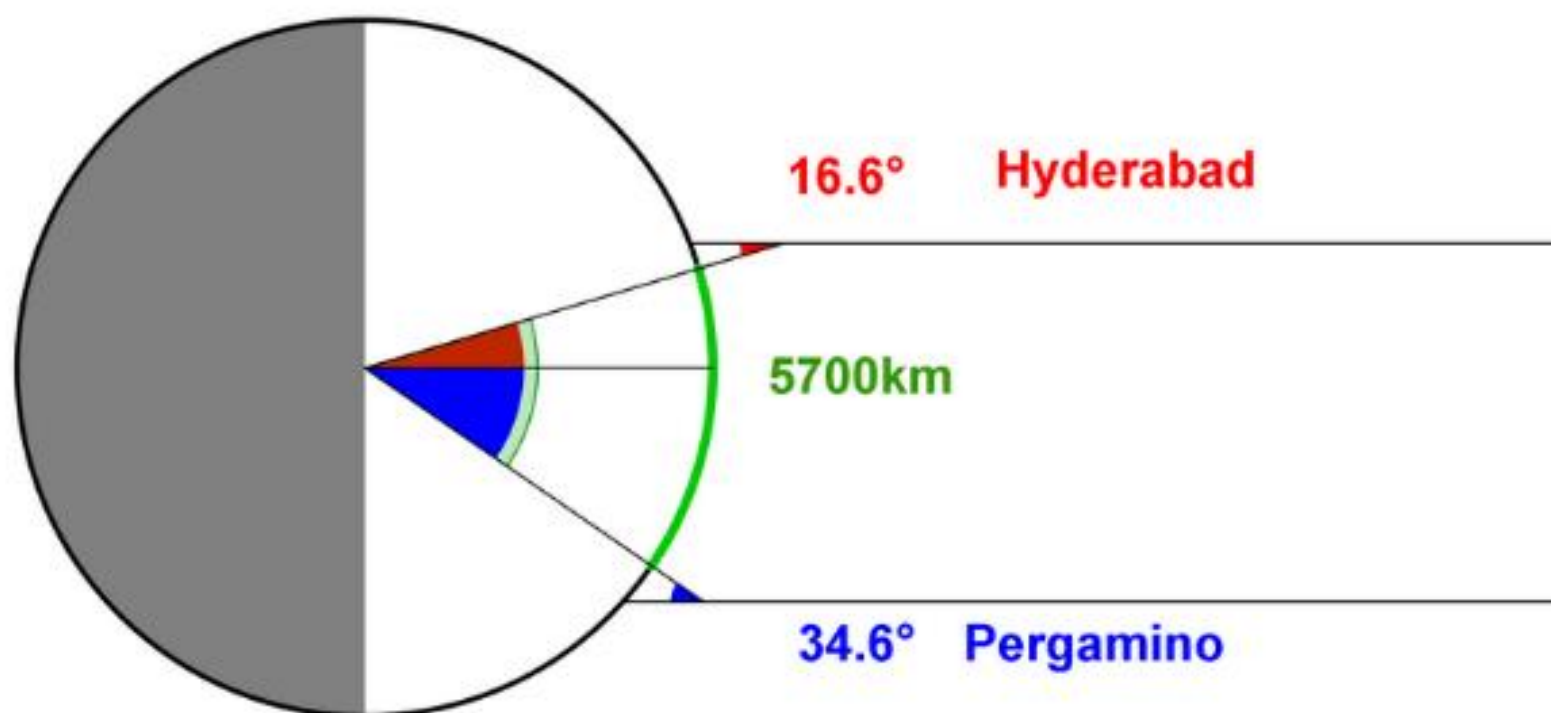


| Flag                                                                             | City      | Country | School        | Latitude (°) +N/-S | Longitude (°) +E/-W |
|----------------------------------------------------------------------------------|-----------|---------|---------------|--------------------|---------------------|
|  | Hyderabad | India   | Space Adhyaan | 17.385             | 78.487              |

| Date         | Gnomon  | Shadow | Angle  |
|--------------|---------|--------|--------|
| 23 September | 10.4 cm | 3.1 cm | 17.3 ° |

**23/09/2017 (Hyderabad-India) Latitude: 17.385°**

**23/09/2017 (Pergamino-Argentina) Latitude: -33.923°**



$$\text{circumference} = \frac{360^\circ \times 5700\text{km}}{16.6^\circ + 34.6^\circ} = 40078 \text{ km}$$



09/23/2017 11:58

# Ilion, Greece

September 2017

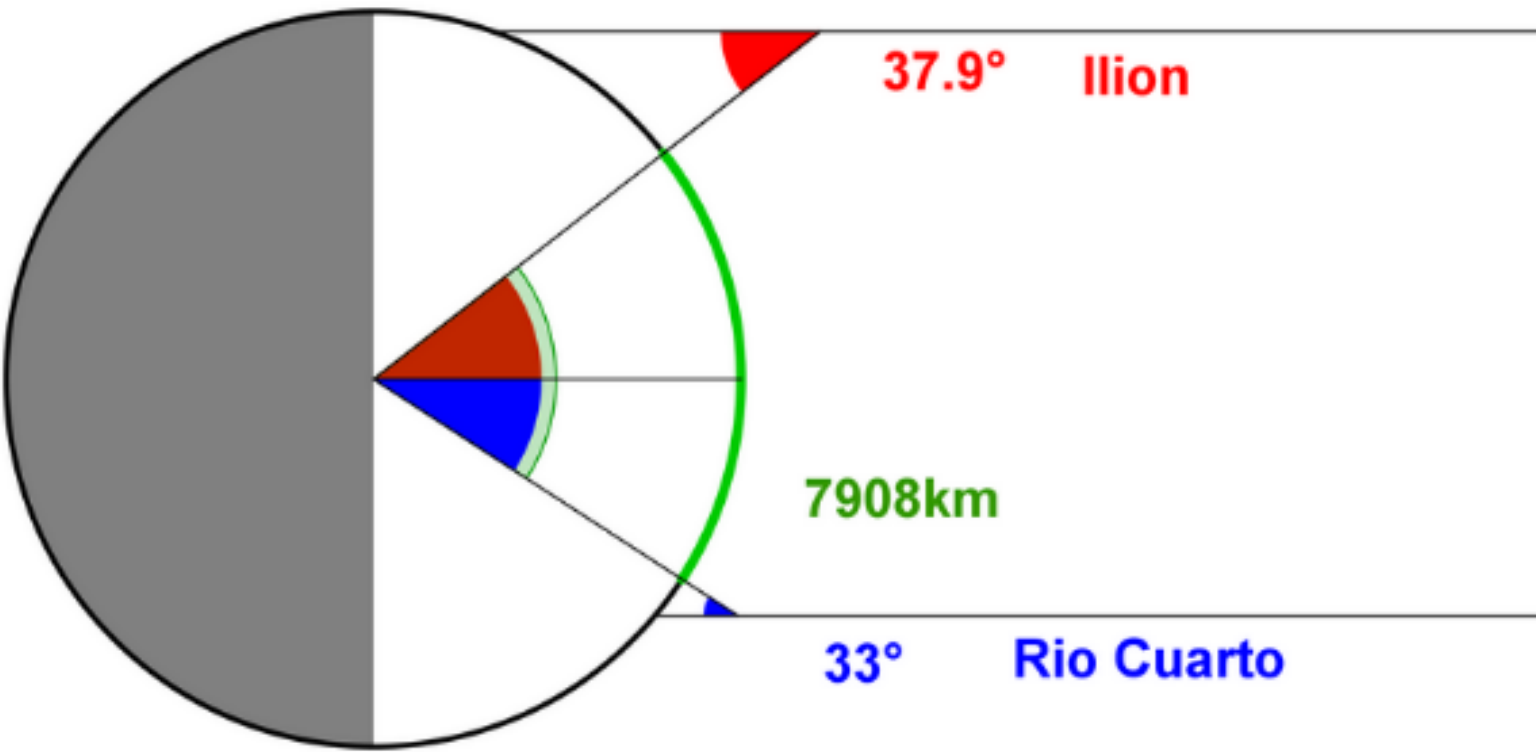


| Flag                                                                             | City  | Country | School                          | Latitude (°) +N/-S | Longitude (°) +E/-W |
|----------------------------------------------------------------------------------|-------|---------|---------------------------------|--------------------|---------------------|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

| Date         | Gnomon | Shadow  | Angle  |
|--------------|--------|---------|--------|
| 21 September | 119 cm | 92.8 cm | 37.9 ° |

21/09/2017 (Ilion-Greece) Latitude: 38.033°

21/09/2017 (Rio Cuarto-Argentina) Latitude: -33.149°



circumference =  $\frac{360^\circ \times 7908\text{km}}{37.9^\circ + 33^\circ} = 40153 \text{ km}$



# Ioannina, Greece

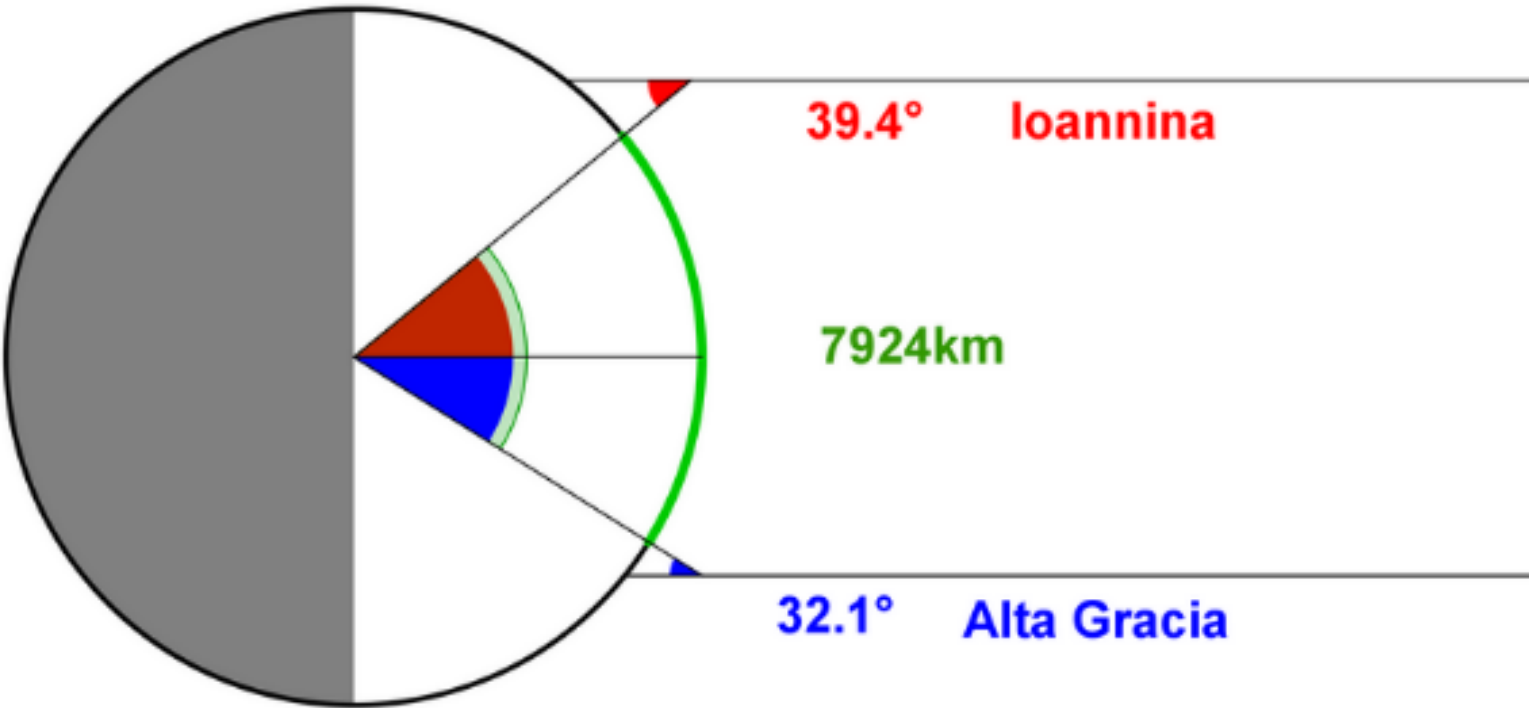
September 2017



| Flag                                                                             | City     | Country | School               | Latitude (°) +N/-S | Longitude (°) +E/-W |
|----------------------------------------------------------------------------------|----------|---------|----------------------|--------------------|---------------------|
|  | Ioannina | Greece  | Experimental College | 39.666             | 20.845              |

| Date         | Gnomon | Shadow  | Angle  |
|--------------|--------|---------|--------|
| 21 September | 100 cm | 82 cm   | 39.4 ° |
| 22 September | 100 cm | 82.7 cm | 39.6 ° |

21/09/2017 (Ioannina-Greece) Latitude: 39.667°  
21/09/2017 (Alta Gracia-Argentina) Latitude: -31.659°



circumference =  $\frac{360^\circ \times 7924\text{km}}{39.4^\circ + 32.1^\circ} = 39897 \text{ km}$



# Itajubá, Brazil

September 2017

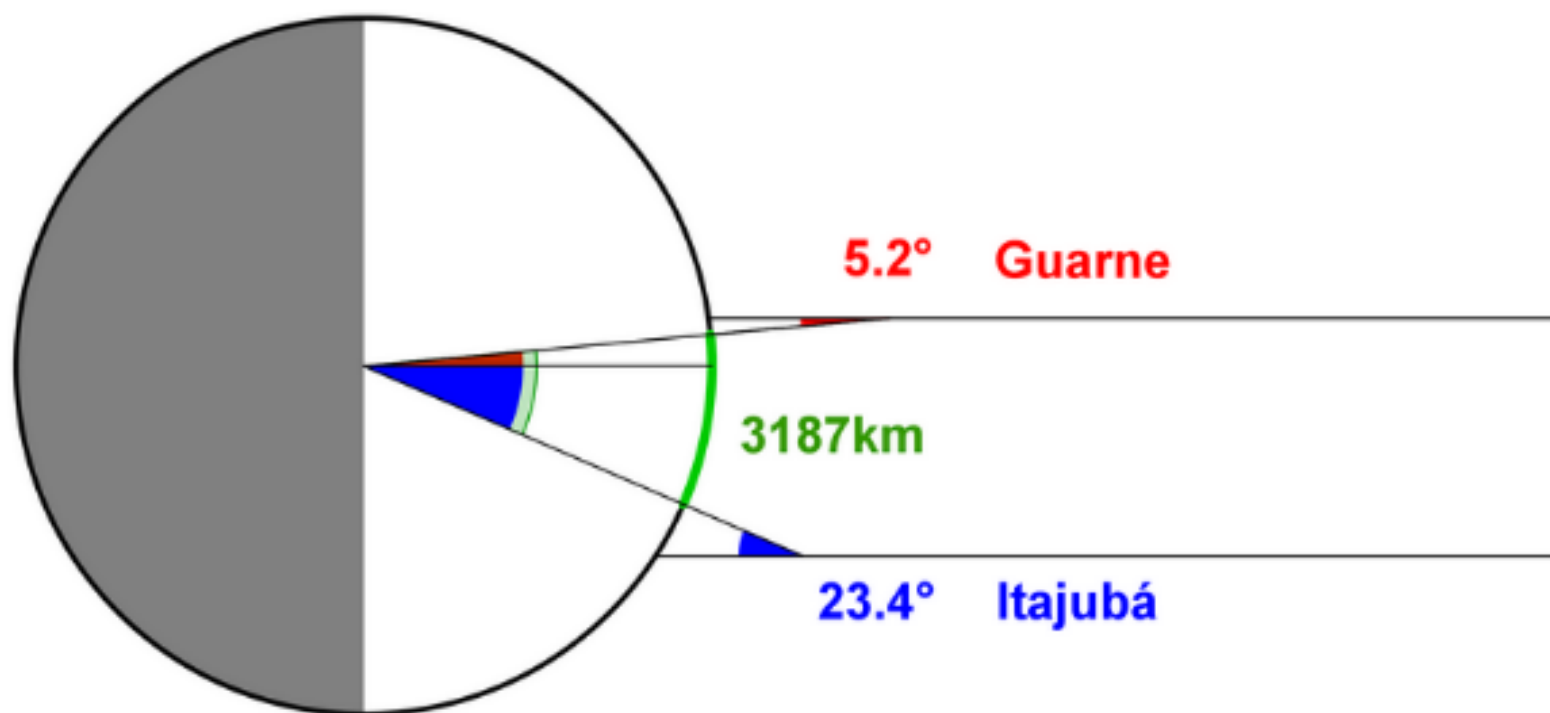


| Flag                                                                             | City    | Country | School                          | Latitude (°) +N/-S | Longitude (°) +E/-W |
|----------------------------------------------------------------------------------|---------|---------|---------------------------------|--------------------|---------------------|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

| Date         | Gnomon  | Shadow   | Angle   |
|--------------|---------|----------|---------|
| 19 September | 81.5 cm | -35.3 cm | -23.4 ° |

19/09/2017 (Guarne-Colombia) Latitude: 6.274°

19/09/2017 (Itajubá-Brazil) Latitude: -22.415°



$$\text{circumference} = \frac{360^\circ \times 3187\text{km}}{5.2^\circ + 23.4^\circ} = 40116 \text{ km}$$



19.09.2017



19.09.2017

# Kuantan, Malaysia

September 2017

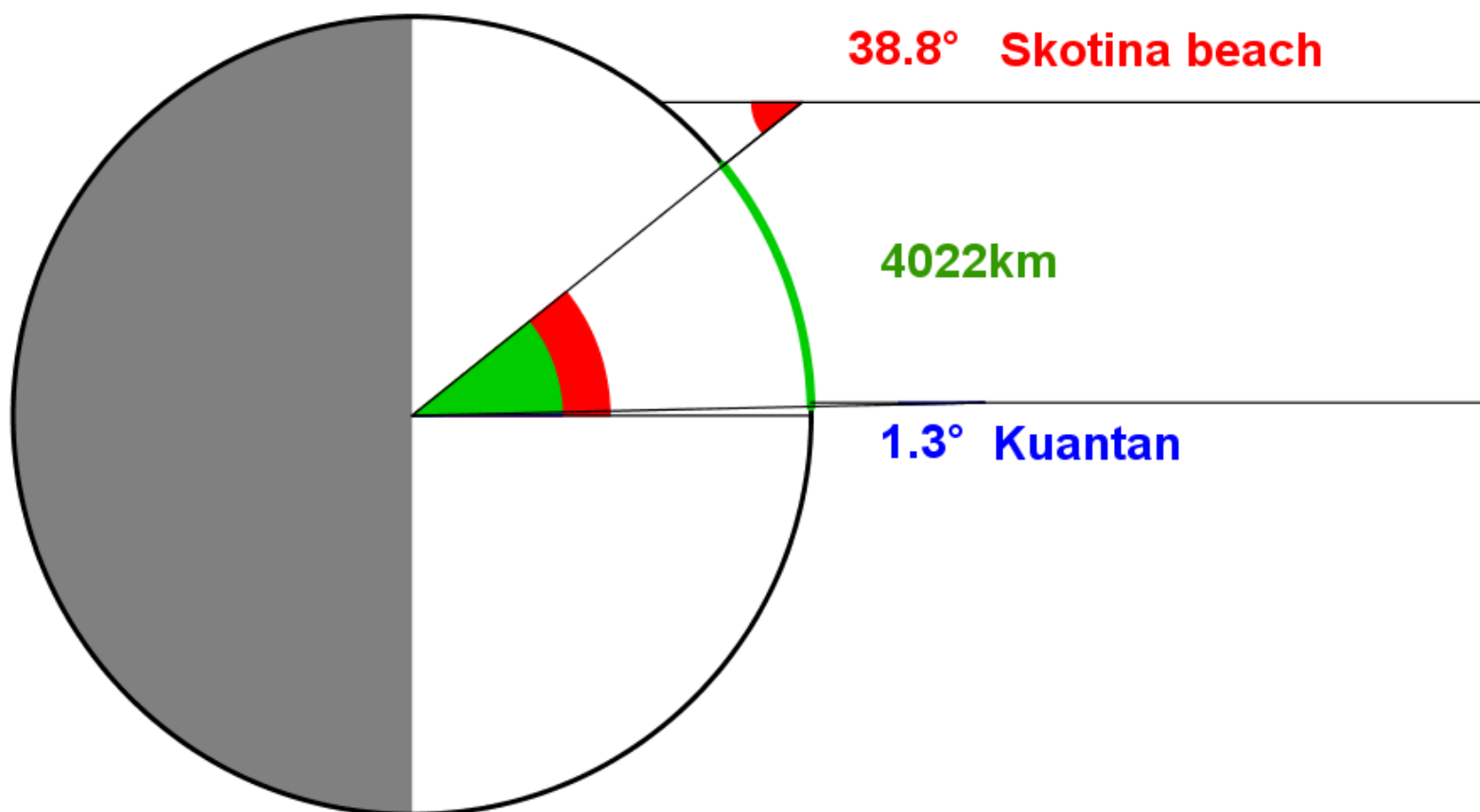


| Flag                                                                             | City    | Country  | School        | Latitude (°) +N/-S | Longitude (°) +E/-W |
|----------------------------------------------------------------------------------|---------|----------|---------------|--------------------|---------------------|
|  | Kuantan | Malaysia | SMK St Thomas | 3.817              | 103.333             |

| Date         | Gnomon | Shadow | Angle |
|--------------|--------|--------|-------|
| 16 September | 77 cm  | 1.7 cm | 1.3 ° |

**16/09/2018 (Skotina beach-Greece) Latitude: 40.027°**

**16/09/2018 (Kuantan-Malaysia) Latitude: 3.827°**



$$\text{circumference} = \frac{360^\circ \times 4022\text{km}}{38.8^\circ - 1.3^\circ} = 38611 \text{ km}$$



# Lafrançaise, France

September 2017

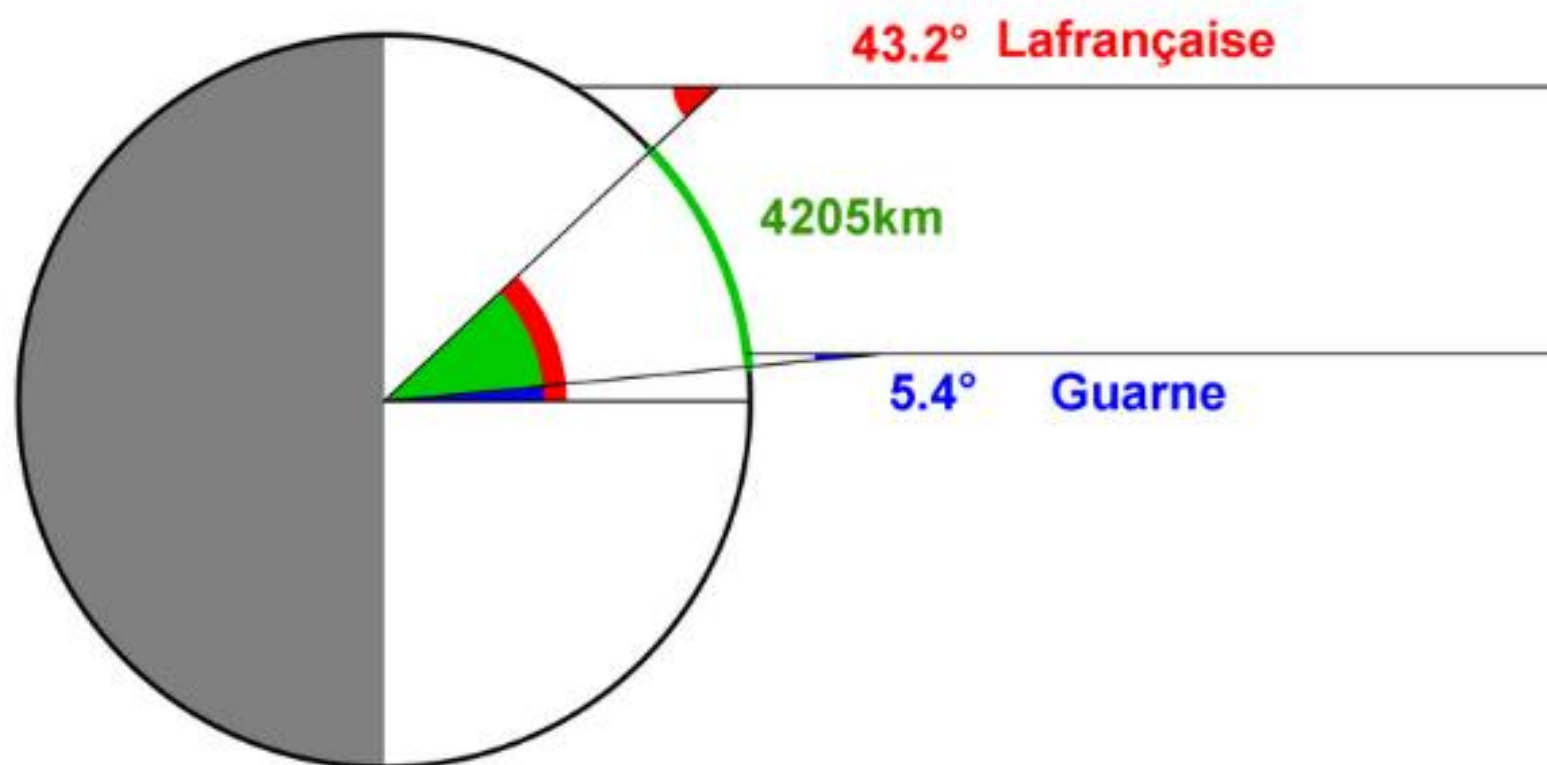


| Flag                                                                             | City        | Country | School                  | Latitude (°) +N/-S | Longitude (°) +E/-W |
|----------------------------------------------------------------------------------|-------------|---------|-------------------------|--------------------|---------------------|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

| Date         | Gnomon | Shadow   | Angle  |
|--------------|--------|----------|--------|
| 05 September | 100 cm | 77 cm    | 37.6 ° |
| 08 September | 100 cm | 81.5 cm  | 39.2 ° |
| 11 September | 100 cm | 82.1 cm  | 39.4 ° |
| 14 September | 100 cm | 85.5 cm  | 40.5 ° |
| 15 September | 100 cm | 86 cm    | 40.7 ° |
| 18 September | 100 cm | 93,8 cm  | 43,2 ° |
| 21 September | 100 cm | 94.6 cm  | 43.4 ° |
| 22 September | 100 cm | 94 cm    | 43.2 ° |
| 28 September | 100 cm | 105.2 cm | 46.5 ° |
| 29 September | 100 cm | 105.4 cm | 46.5 ° |

**18/09/2017 (Lafrançaise-France) Latitude: 44.127°**

**18/09/2017 (Guarne-Colombia) Latitude: 6.274°**



$$\text{circumference} = \frac{360^\circ \times 4205\text{km}}{43.2^\circ - 5.4^\circ} = 40048 \text{ km}$$



# Lago San Pablo, Ecuador

September 2017

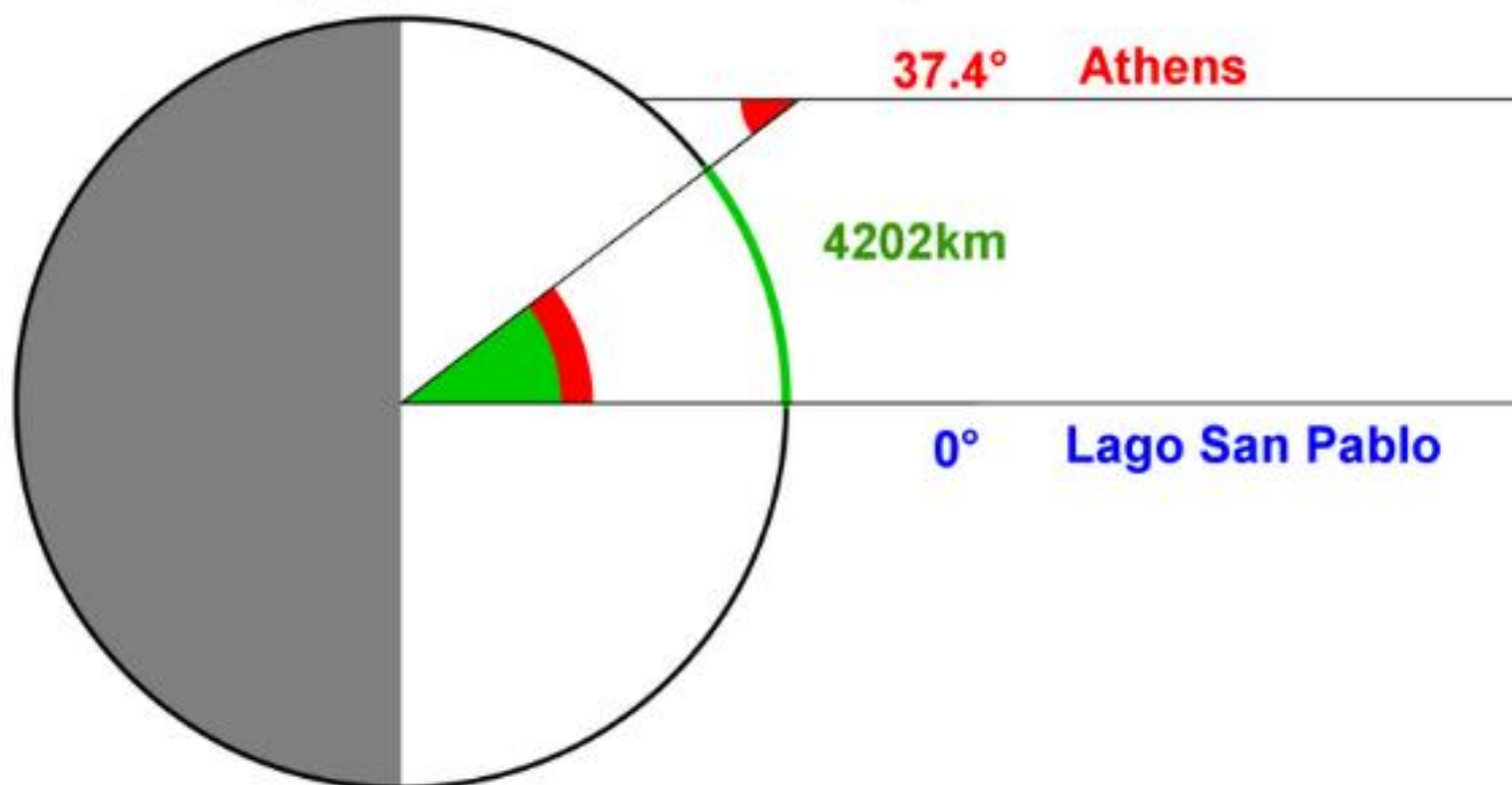


| Flag                                                                             | City           | Country | School | Latitude (°) +N/-S | Longitude (°) +E/-W |
|----------------------------------------------------------------------------------|----------------|---------|--------|--------------------|---------------------|
|  | Lago San Pablo | Ecuador |        | 0.206              | -78.203             |

| Date         | Gnomon | Shadow | Angle |
|--------------|--------|--------|-------|
| 20 September | 400 cm | 0 cm   | 0 °   |

**20/09/2017 (Athens-Greece) Latitude: 38.028°**

**20/09/2017 (Lago San Pablo-Ecuador) Latitude: 0.206°**



$$\text{circumference} = \frac{360^\circ \times 4202\text{km}}{37.4^\circ - 0^\circ} = 40447 \text{ km}$$



# Mărgineni, Romania

September 2017

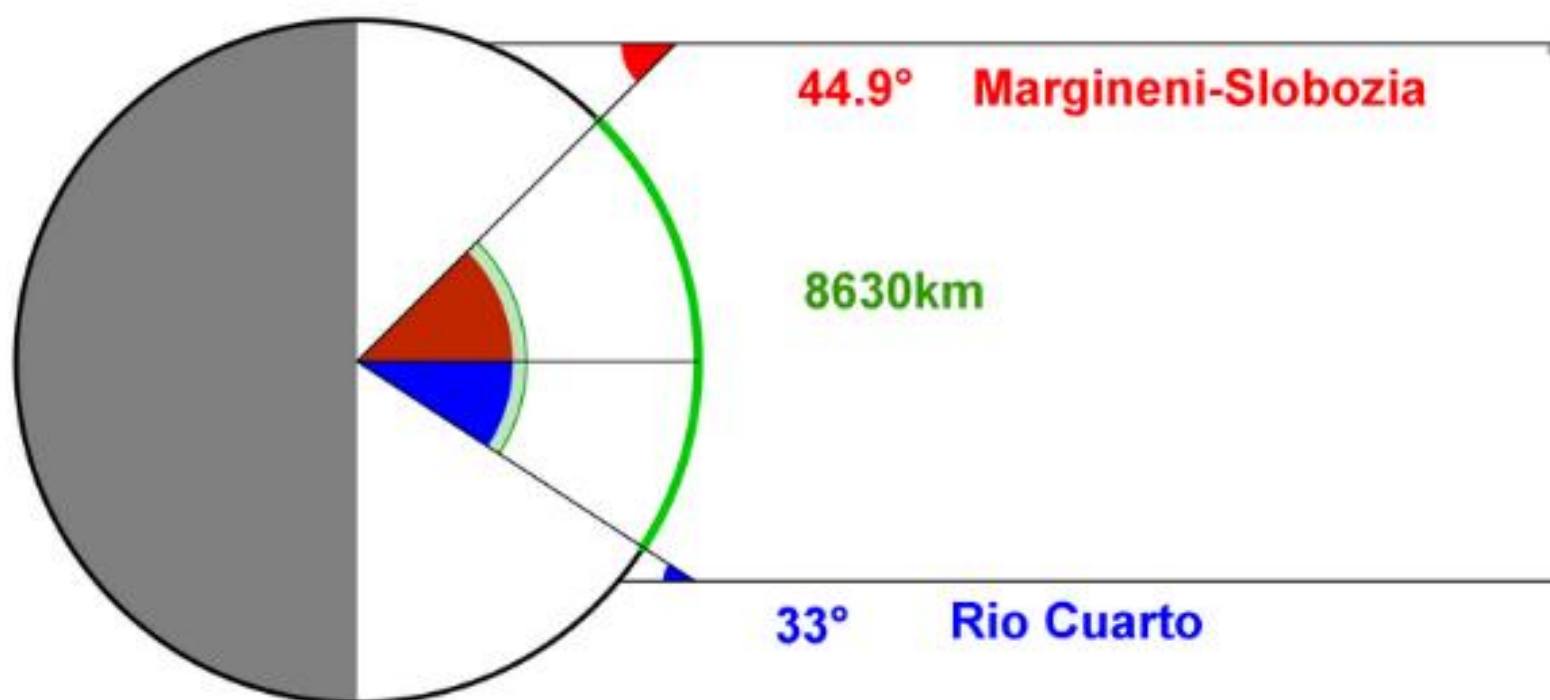


| Flag                                                                             | City      | Country | School             | Latitude (°) +N/-S | Longitude (°) +E/-W |
|----------------------------------------------------------------------------------|-----------|---------|--------------------|--------------------|---------------------|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

| Date         | Gnomon | Shadow  | Angle  |
|--------------|--------|---------|--------|
| 21 September | 100 cm | 99.8 cm | 44.9 ° |

**21/09/2017 (Margineni-Slobozia-Romania) Latitude: 44.533°**

**21/09/2017 (Rio Cuarto-Argentina) Latitude: -33.149°**



$$\text{circumference} = \frac{360^\circ \times 8630\text{km}}{44.9^\circ + 33^\circ} = 39882 \text{ km}$$

21.09.2017



# Maricá, Brazil

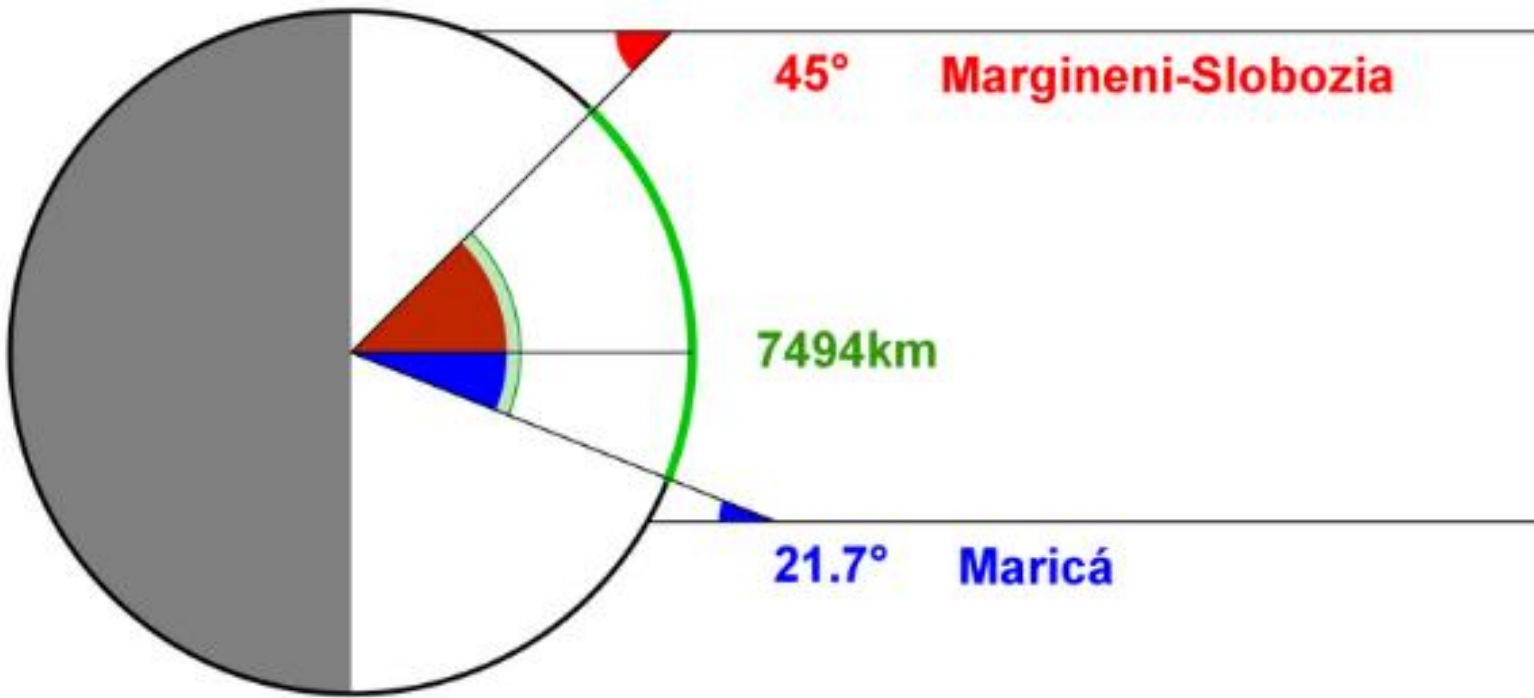
September 2017



| Flag                                                                             | City   | Country | School                    | Latitude (°) +N/-S | Longitude (°) +E/-W |
|----------------------------------------------------------------------------------|--------|---------|---------------------------|--------------------|---------------------|
|  | Maricá | Brazil  | Grupo 84 Cidade de Maricá | -22.919            | -42.817             |

| Date         | Gnomon   | Shadow   | Angle   |
|--------------|----------|----------|---------|
| 22 September | 124.5 cm | -49.5 cm | -21.7 ° |

22/09/2017 (Margineni-Slobozia-Romania) Latitude: 44.553°  
22/09/2017 (Maricá-Brazil) Latitude: -22.9°



circumference =  $\frac{360^\circ \times 7494\text{km}}{45^\circ + 21.7^\circ} = 40447 \text{ km}$



# Marina di Carrara, Italy

September 2017

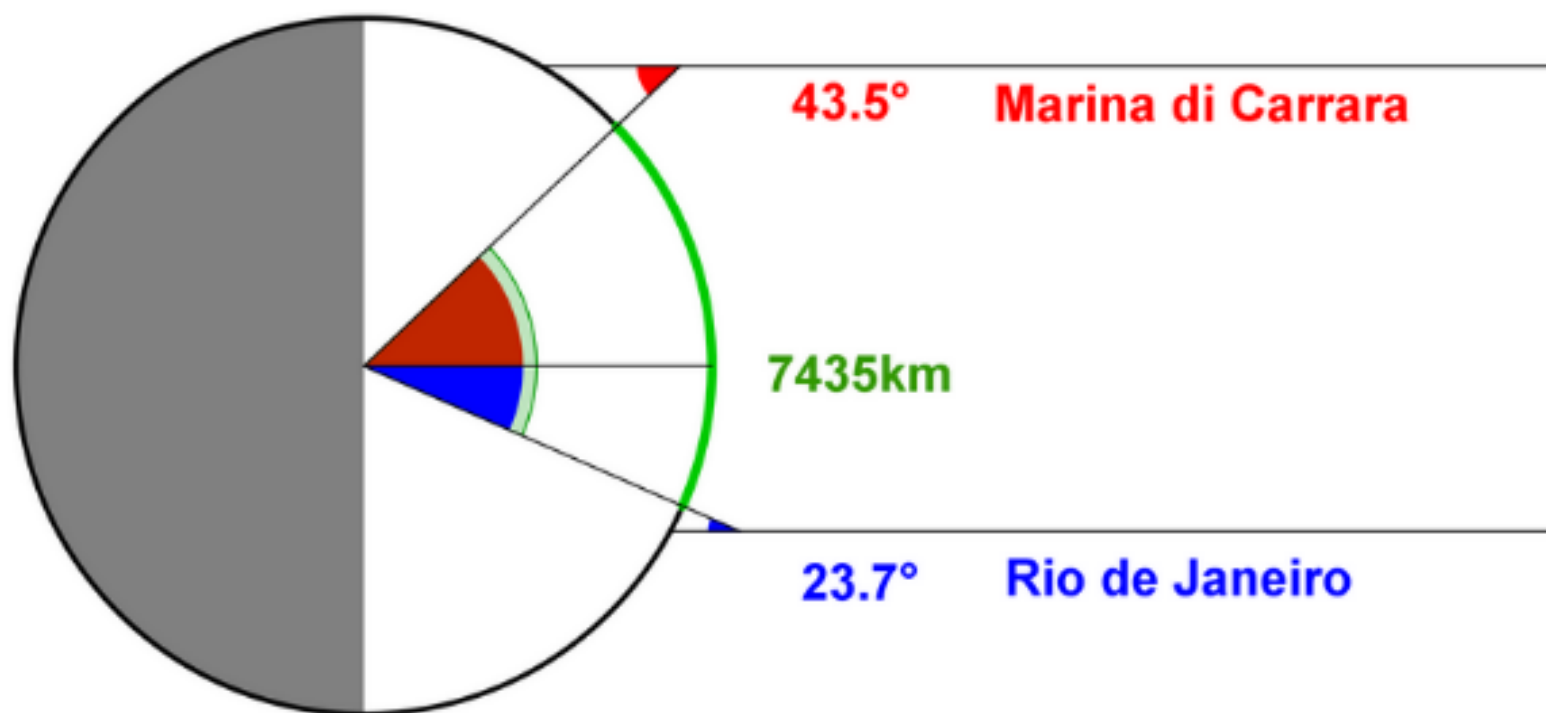


| Flag                                                                             | City              | Country | School                      | Latitude (°) +N/-S | Longitude (°) +E/-W |
|----------------------------------------------------------------------------------|-------------------|---------|-----------------------------|--------------------|---------------------|
|  | Marina di Carrara | Italy   | M Buonarroti primary school | 44.045             | 10.031              |

| Date         | Gnomon | Shadow | Angle  |
|--------------|--------|--------|--------|
| 22 September | 10 cm  | 9.5 cm | 43.5 ° |

**22/09/2017 (Marina di Carrara-Italy) Latitude: 44.033°**

**22/09/2017 (Rio de Janeiro-Brazil) Latitude: -22.89°**



$$\text{circumference} = \frac{360^\circ \times 7435\text{km}}{43.5^\circ + 23.7^\circ} = 39830 \text{ km}$$



# Medellín Americas, Colombia

September 2017

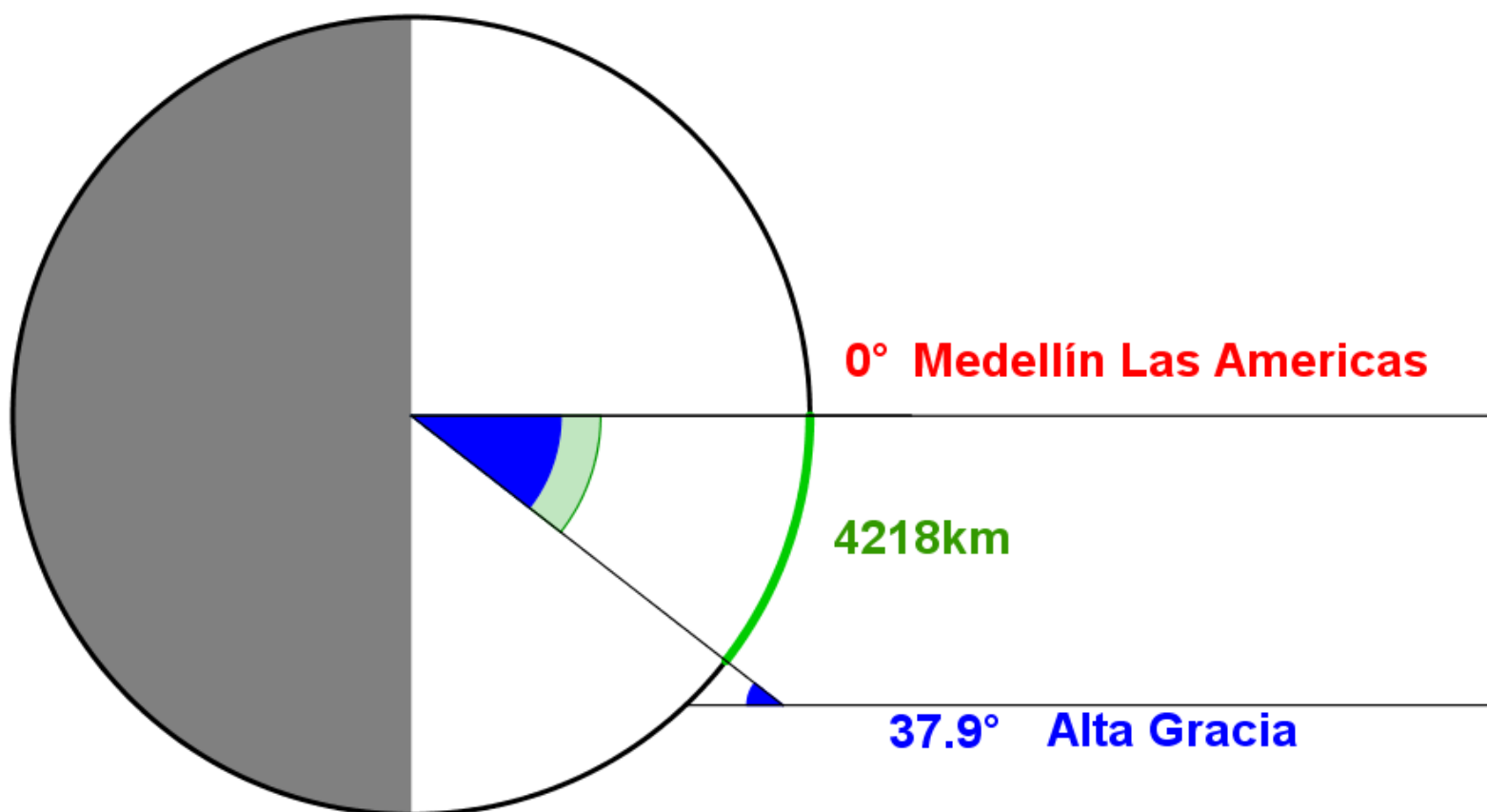


| Flag                                                                             | City     | Country  | School                      | Latitude (°) +N/-S | Longitude (°) +E/-W |
|----------------------------------------------------------------------------------|----------|----------|-----------------------------|--------------------|---------------------|
|  | Medellín | Colombia | I.E. Ciudadela las Americas | 6.309              | -75.575             |

| Date         | Gnomon | Shadow | Angle |
|--------------|--------|--------|-------|
| 06 September | 100 cm | 0 cm   | 0 °   |

**06/09/2017 (Medellín Las Americas-Colombia) Latitude: 6.309°**

**06/09/2017 (Alta Gracia-Argentina) Latitude: -31.659°**



$$\text{circumference} = \frac{360^\circ \times 4218\text{km}}{0^\circ + 37.9^\circ} = 40065 \text{ km}$$



# Medellín Corazón, Colombia

September 2017

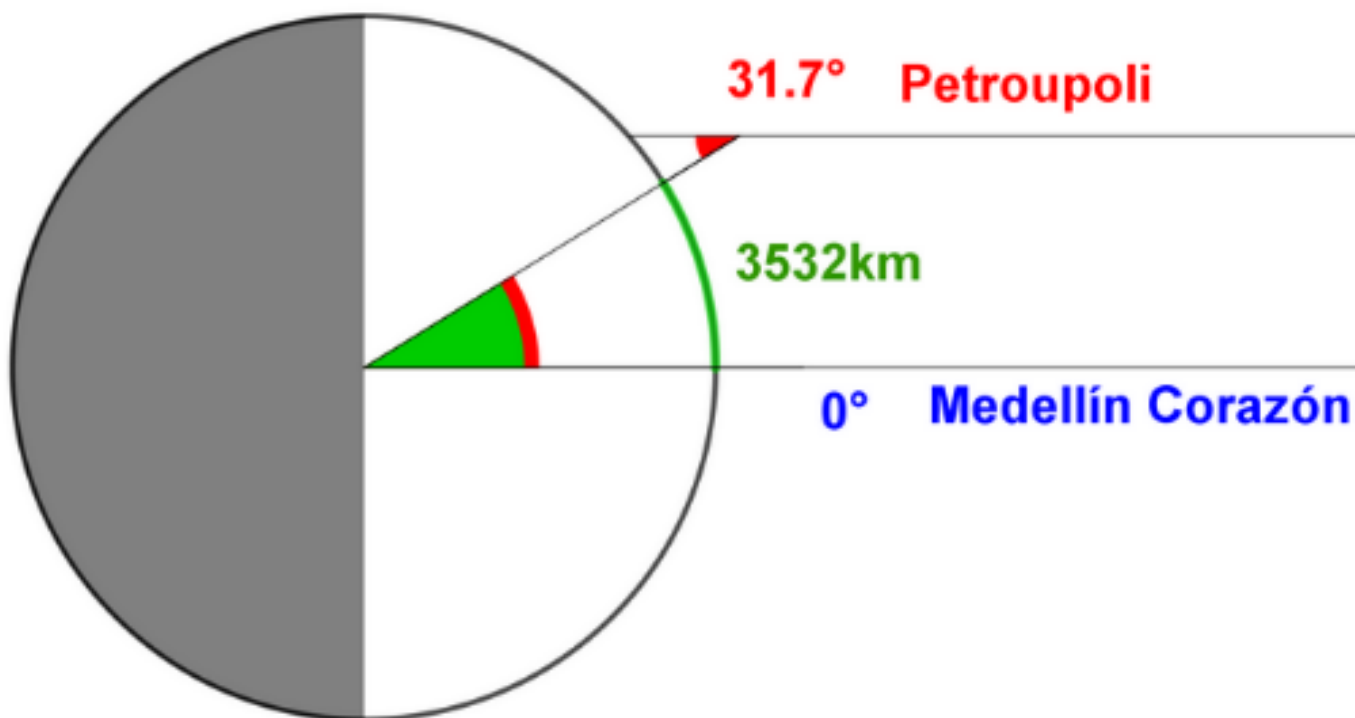


| Flag                                                                             | City     | Country  | School          | Latitude (°) +N/-S | Longitude (°) +E/-W |
|----------------------------------------------------------------------------------|----------|----------|-----------------|--------------------|---------------------|
|  | Medellín | Colombia | I.E. el Corazón | 6.247              | -75.629             |

| Date         | Gnomon | Shadow | Angle |
|--------------|--------|--------|-------|
| 06 September | 100 cm | 0 cm   | 0 °   |

06/09/2017 (Petroupoli-Greece) Latitude: 38.036°

06/09/2017 (Medellín Corazón-Colombia) Latitude: 6.247°



$$\text{circumference} = \frac{360^\circ \times 3532\text{km}}{31.7^\circ - 0^\circ} = 40111 \text{ km}$$



# Medellín Londoño, Colombia

September 2017

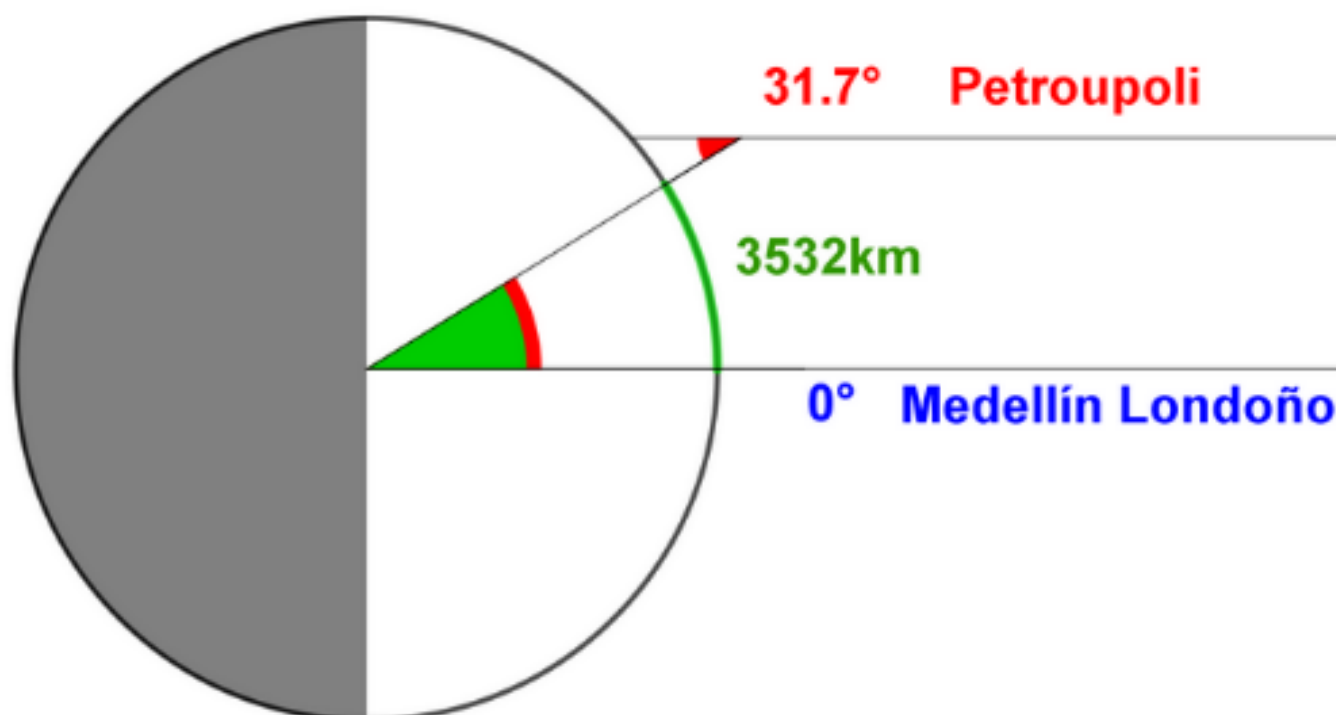


| Flag                                                                             | City     | Country  | School               | Latitude (°) +N/-S | Longitude (°) +E/-W |
|----------------------------------------------------------------------------------|----------|----------|----------------------|--------------------|---------------------|
|  | Medellín | Colombia | I.E. Javiera Londoño | 6.249              | -75.560             |

| Date         | Gnomon  | Shadow  | Angle |
|--------------|---------|---------|-------|
| 06 September | 100 cm  | 0 cm    | 0 °   |
| 22 September | 91.7 cm | 10.2 cm | 6.3 ° |

06/09/2017 (Petroupoli-Greece) Latitude: 38.036°

06/09/2017 (Medellín Londoño-Colombia) Latitude: 6.249°



$$\text{circumference} = \frac{360^\circ \times 3532\text{km}}{31.7^\circ - 0^\circ} = 40111 \text{ km}$$



# Medellín Universidad, Colombia

September 2017

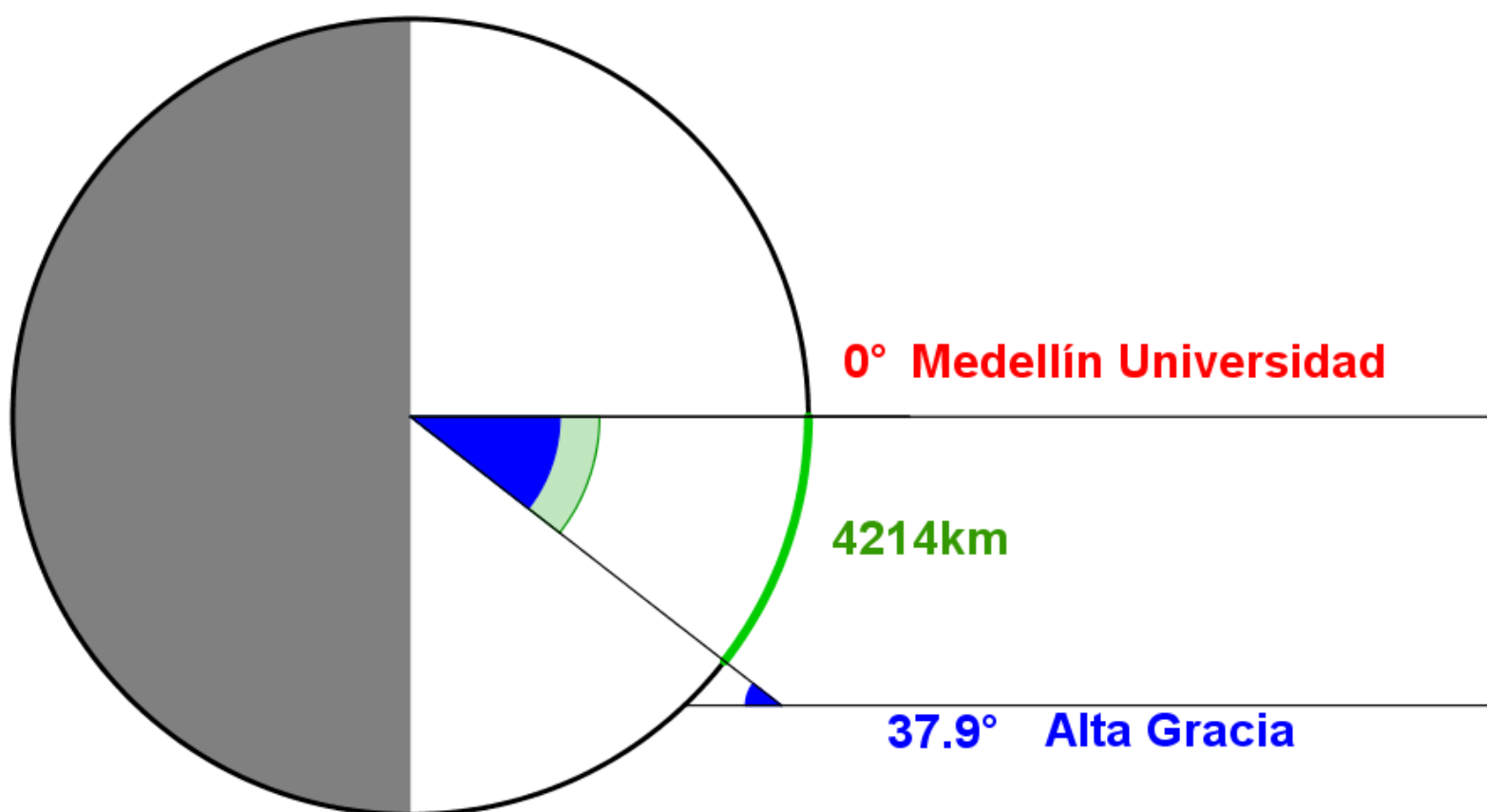


| Flag                                                                             | City     | Country  | School                   | Latitude (°) +N/-S | Longitude (°) +E/-W |
|----------------------------------------------------------------------------------|----------|----------|--------------------------|--------------------|---------------------|
|  | Medellín | Colombia | Universidad de Antioquia | 6.267              | -75.569             |

| Date         | Gnomon | Shadow | Angle |
|--------------|--------|--------|-------|
| 06 September | 100 cm | 0 cm   | 0 °   |

**06/09/2017 (Medellín Universidad-Colombia) Latitude: 6.267°**

**06/09/2017 (Alta Gracia-Argentina) Latitude: -31.659°**



$$\text{circumference} = \frac{360^\circ \times 4214\text{km}}{0^\circ + 37.9^\circ} = 40027 \text{ km}$$



# Pergamino, Argentina

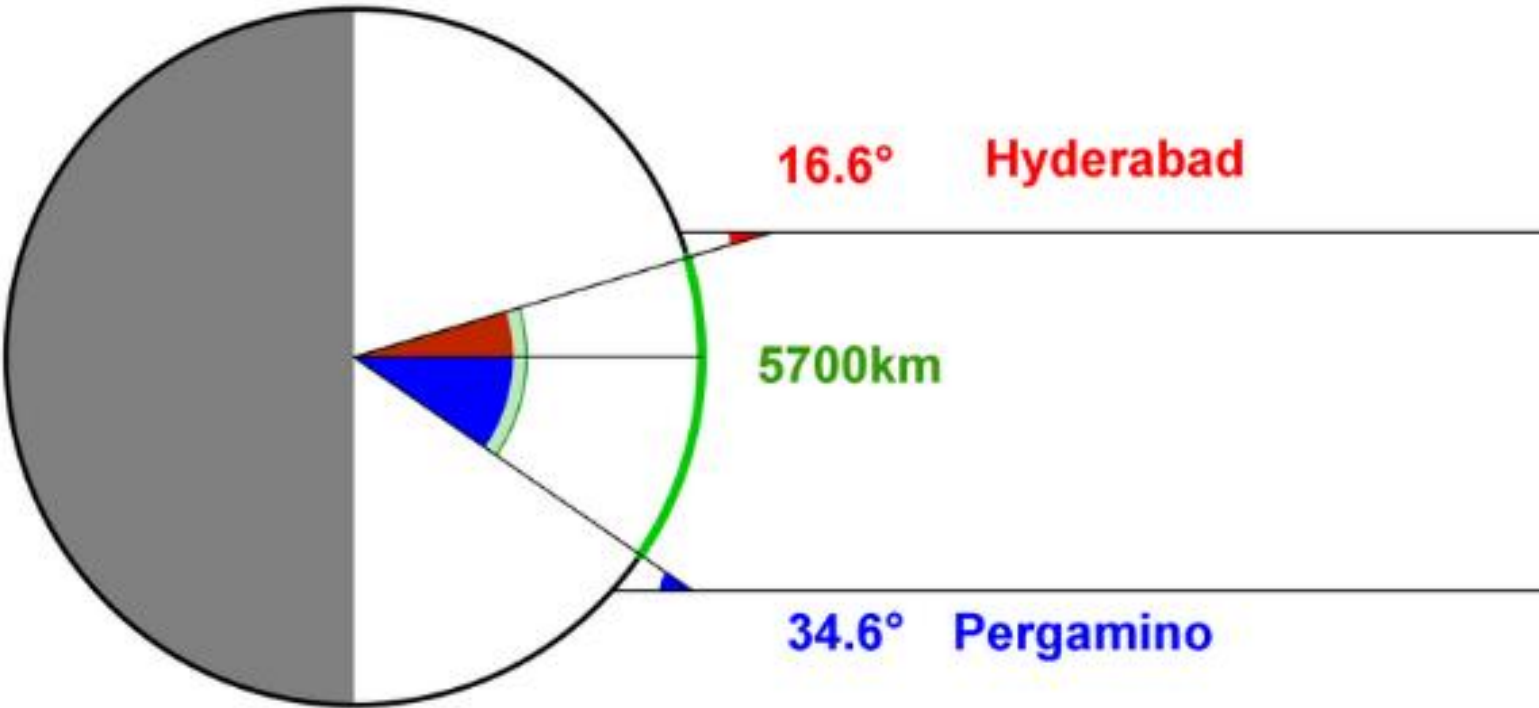
September 2017



| Flag                                                                             | City      | Country   | School | Latitude (°) +N/-S | Longitude (°) +E/-W |
|----------------------------------------------------------------------------------|-----------|-----------|--------|--------------------|---------------------|
|  | Pergamino | Argentina |        | -33.923            | -60.573             |

| Date         | Gnomon | Shadow | Angle   |
|--------------|--------|--------|---------|
| 23 September | 97 cm  | -67 cm | -34.6 ° |

23/09/2017 (Hyderabad-India) Latitude: 17.385°  
23/09/2017 (Pergamino-Argentina) Latitude: -33.923°



circumference =  $\frac{360^\circ \times 5700\text{km}}{16.6^\circ + 34.6^\circ} = 40078 \text{ km}$



# Petroupoli, Greece

September 2017

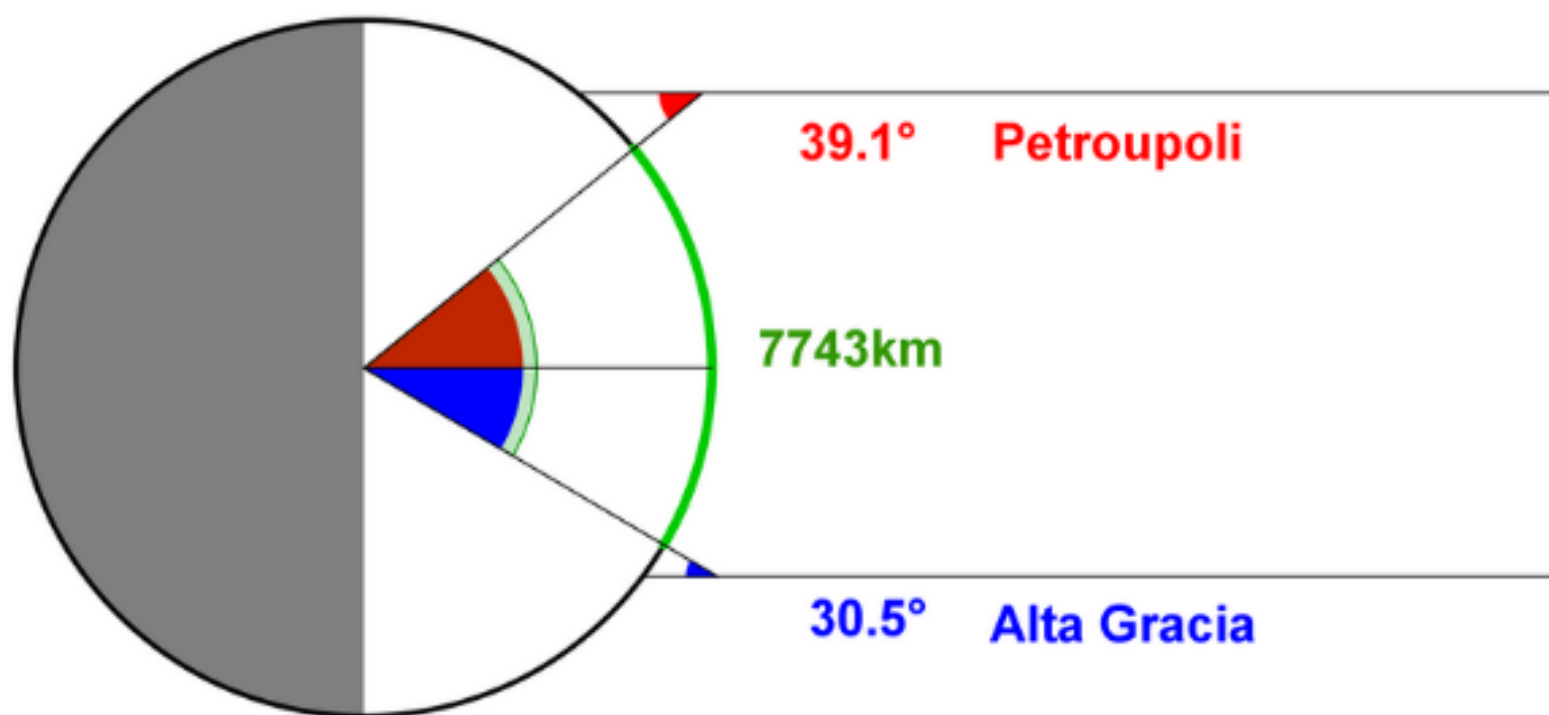


| Flag                                                                             | City       | Country | School                | Latitude (°) +N/-S | Longitude (°) +E/-W |
|----------------------------------------------------------------------------------|------------|---------|-----------------------|--------------------|---------------------|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

| Date         | Gnomon  | Shadow  | Angle  |
|--------------|---------|---------|--------|
| 04 September | 52.3 cm | 31.2 cm | 30.8 ° |
| 06 September | 52.3 cm | 32.3 cm | 31.7 ° |
| 07 September | 52.3 cm | 32.7 cm | 32 °   |
| 08 September | 52.3 cm | 33.1 cm | 32.3 ° |
| 22 September | 52.3 cm | 40.8 cm | 38 °   |
| 25 September | 52.3 cm | 42.5 cm | 39.1 ° |

**25/09/2017 (Petroupoli-Greece) Latitude: 38.036°**

**25/09/2017 (Alta Gracia-Argentina) Latitude: -31.659°**



$$\text{circumference} = \frac{360^\circ \times 7743\text{km}}{39.1^\circ + 30.5^\circ} = 40050 \text{ km}$$



# Piraeus, Greece

September 2017

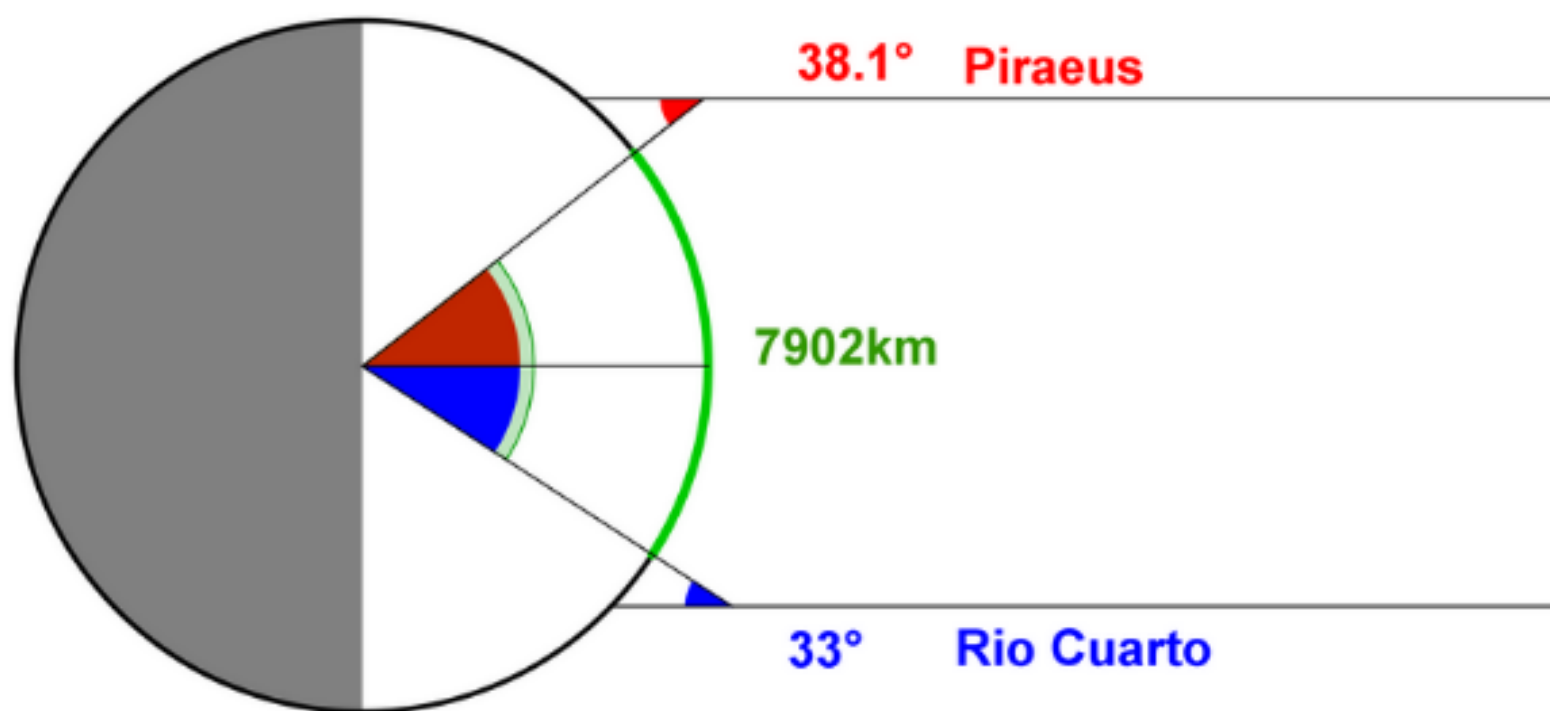


| Flag                                                                             | City    | Country | School                               | Latitude (°) +N/-S | Longitude (°) +E/-W |
|----------------------------------------------------------------------------------|---------|---------|--------------------------------------|--------------------|---------------------|
|  | Piraeus | Greece  | 2nd Junior High School of Korydallos | 37.977             | 23.655              |

| Date         | Gnomon | Shadow  | Angle  |
|--------------|--------|---------|--------|
| 22 September | 100 cm | 78.5 cm | 38.1 ° |

22/9/2017 (Piraeus-Greece) Latitude: 37.977°

22/09/2017 (Rio Cuarto-Argentina) Latitude: -33.149°



$$\text{circumference} = \frac{360^\circ \times 7902\text{km}}{38.1^\circ + 33^\circ} = 40010 \text{ km}$$



# Piranguinho, Brazil

September 2017

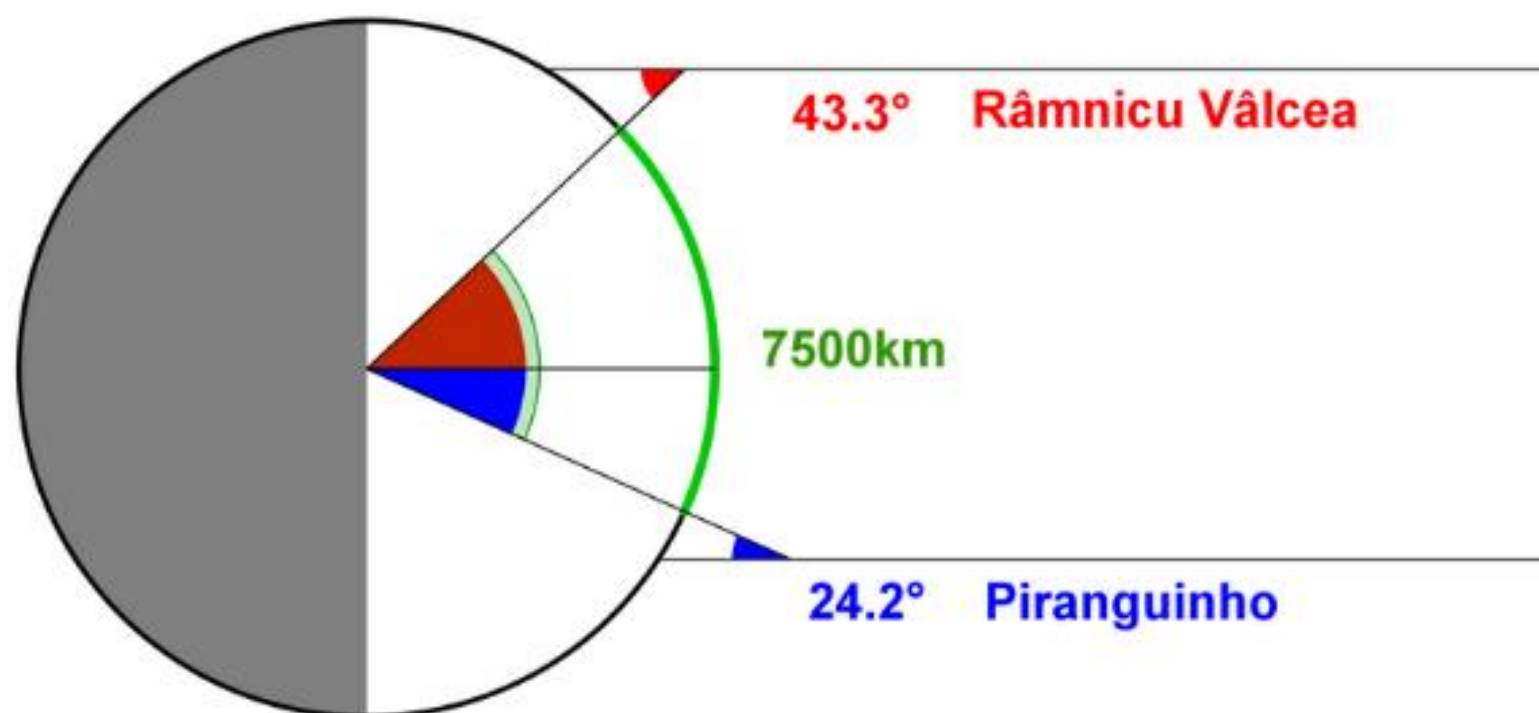


| Flag                                                                             | City        | Country | School                          | Latitude (°) +N/-S | Longitude (°) +E/-W |
|----------------------------------------------------------------------------------|-------------|---------|---------------------------------|--------------------|---------------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

| Date         | Gnomon | Shadow   | Angle   |
|--------------|--------|----------|---------|
| 18 September | 70 cm  | -31.4 cm | -24.2 ° |

18/09/2017 (Râmnicu Vâlcea-Romania) Latitude: 45.093°

18/09/2017 (Piranguinho-Brazil) Latitude: -22.411°



$$\text{circumference} = \frac{360^\circ \times 7500\text{km}}{43.3^\circ + 24.2^\circ} = 40000 \text{ km}$$



# Popayan, Colombia

September 2017

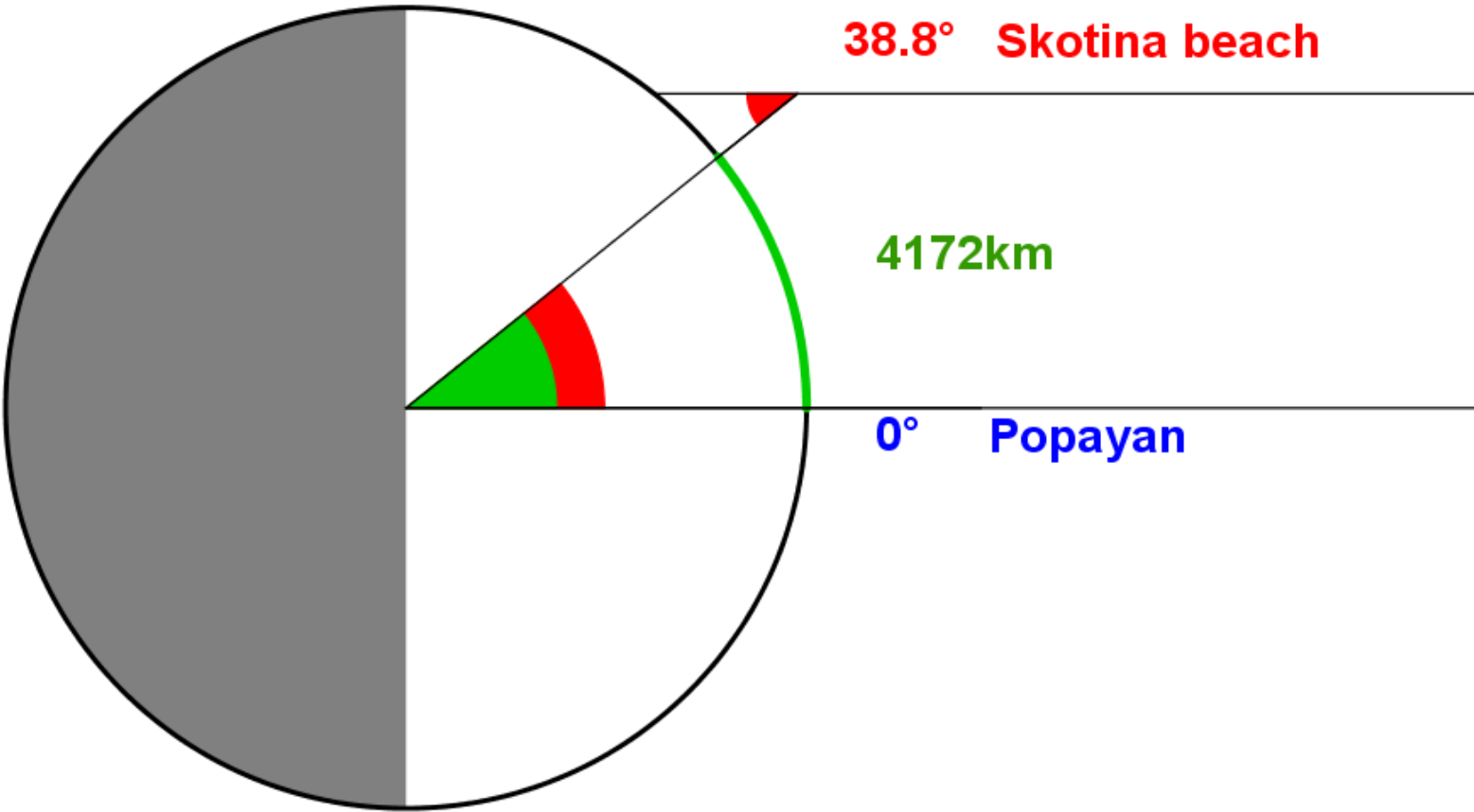


| Flag                                                                             | City    | Country  | School                | Latitude (°) +N/-S | Longitude (°) +E/-W |
|----------------------------------------------------------------------------------|---------|----------|-----------------------|--------------------|---------------------|
|  | Popayan | Colombia | I.E. Gabriela Mistral | 2.471              | -76.579             |

| Date         | Gnomon | Shadow | Angle |
|--------------|--------|--------|-------|
| 16 September | 100 cm | 0 cm   | 0 °   |

16/09/2018 (Skotina beach-Greece) Latitude: 40.027°

16/09/2018 (Popayan-Colombia) Latitude: 2.471°



circumference =  $\frac{360^\circ \times 4172\text{km}}{38.8^\circ - 0^\circ} = 38709 \text{ km}$



# Quitsato, Ecuador

September 2017

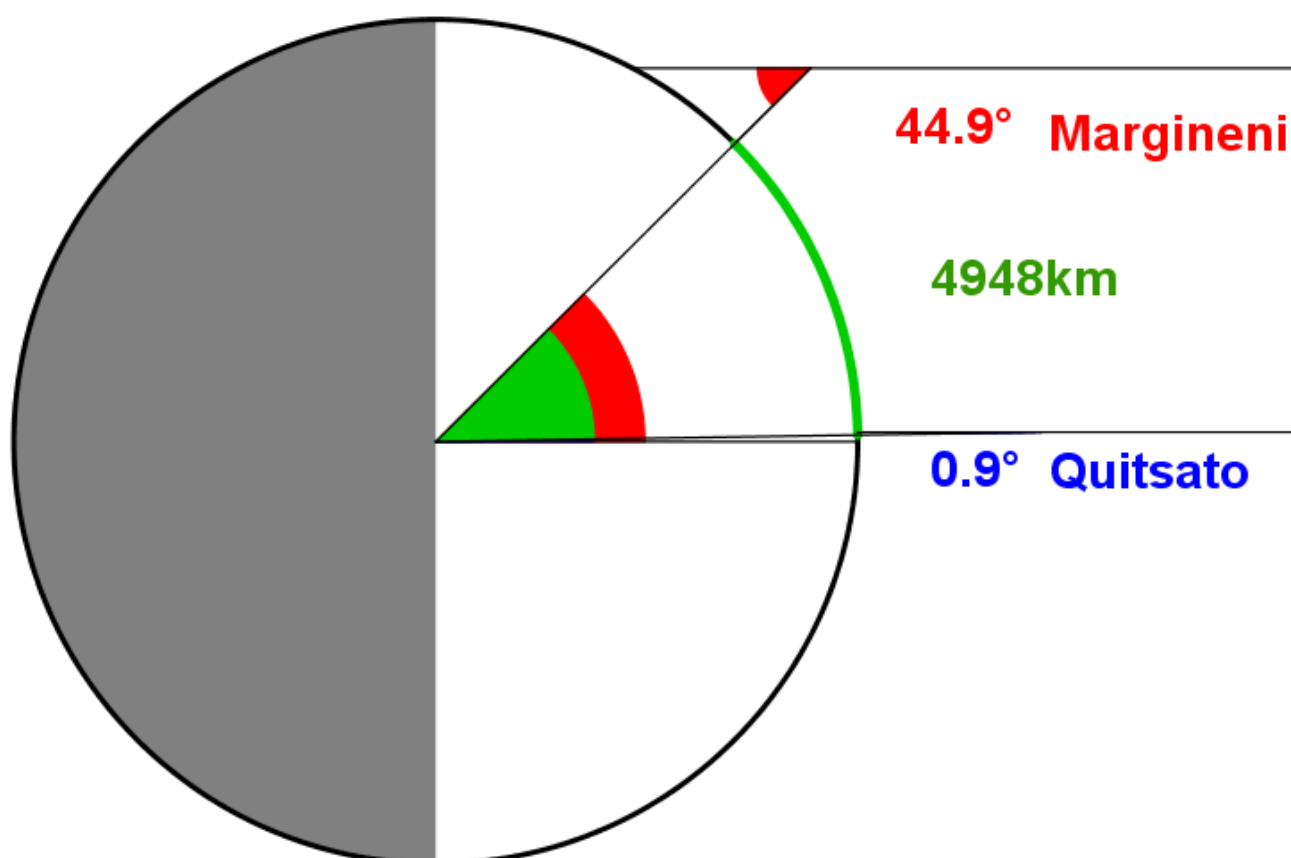


| Flag                                                                             | City     | Country | School                         | Latitude (°) +N/-S | Longitude (°) +E/-W |
|----------------------------------------------------------------------------------|----------|---------|--------------------------------|--------------------|---------------------|
|  | Quitsato | Ecuador | La Mitad del Mundo Reloj Solar | 0,000              | -78.175             |

| Date         | Gnomon  | Shadow | Angle |
|--------------|---------|--------|-------|
| 21 September | 1000 cm | 15 cm  | 0.9 ° |

**21/09/2017 (Margineni-Romania) Latitude: 44.533°**

**21/09/2017 (Quitsato-Ecuador) Latitude: 0°**



$$\text{circumference} = \frac{360^\circ \times 4948\text{km}}{44.9^\circ - 0.9^\circ} = 40484 \text{ km}$$



# Râmnicu Vâlcea, Romania

September 2017

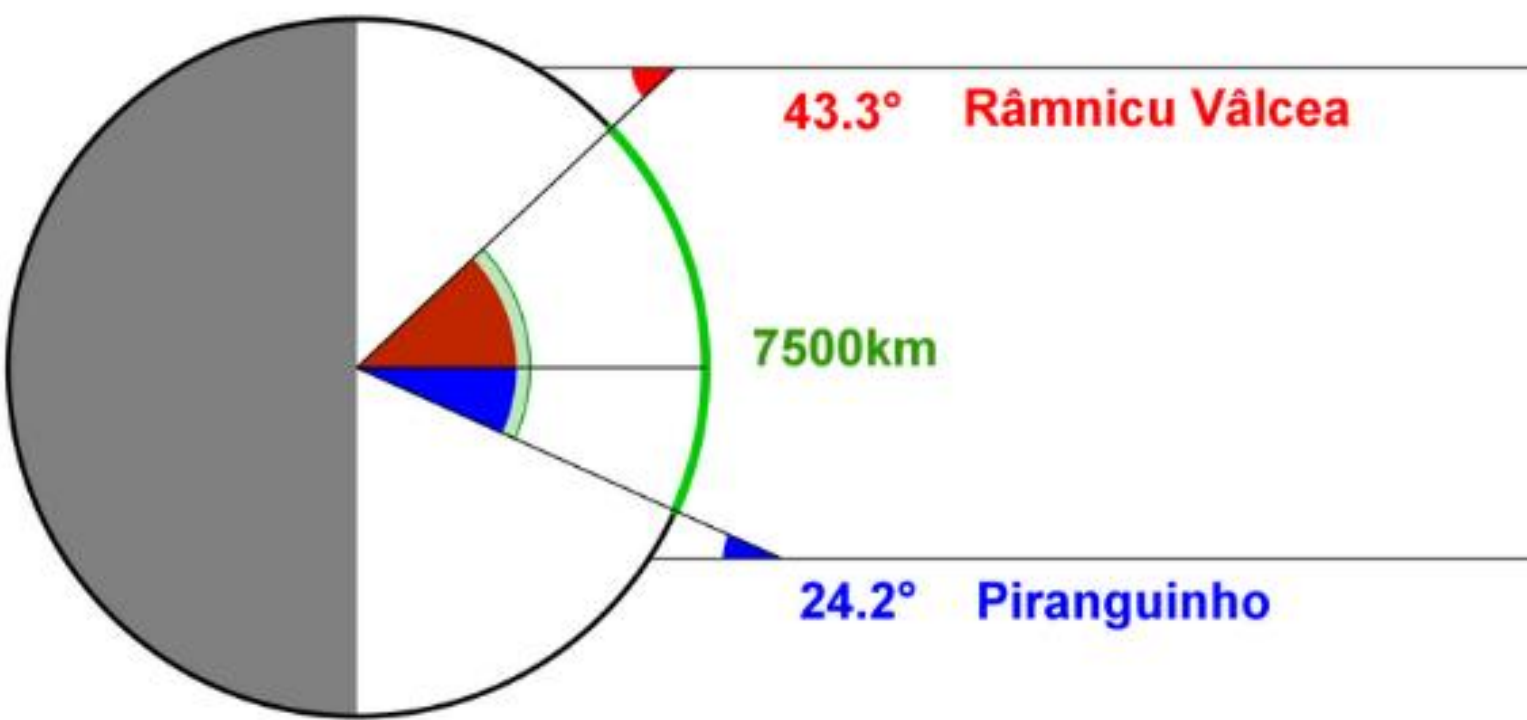


| Flag                                                                             | City           | Country | School                              | Latitude (°)<br>+N/-S | Longitude (°)<br>+E/-W |
|----------------------------------------------------------------------------------|----------------|---------|-------------------------------------|-----------------------|------------------------|
|  | Râmnicu Vâlcea | Romania | S.G. Nr4 Gradinita Dumbrava Minuata | 45.093                | 24.358                 |

| Date         | Gnomon | Shadow  | Angle  |
|--------------|--------|---------|--------|
| 18 September | 51 cm  | 48.1 cm | 43.3 ° |

18/09/2017 (Râmnicu Vâlcea-Romania) Latitude: 45.093°

18/09/2017 (Piranguinho-Brazil) Latitude: -22.411°



circumference =  $\frac{360^\circ \times 7500\text{km}}{43.3^\circ + 24.2^\circ} = 40000 \text{ km}$



# Rio Cuarto 79, Argentina

September 2017

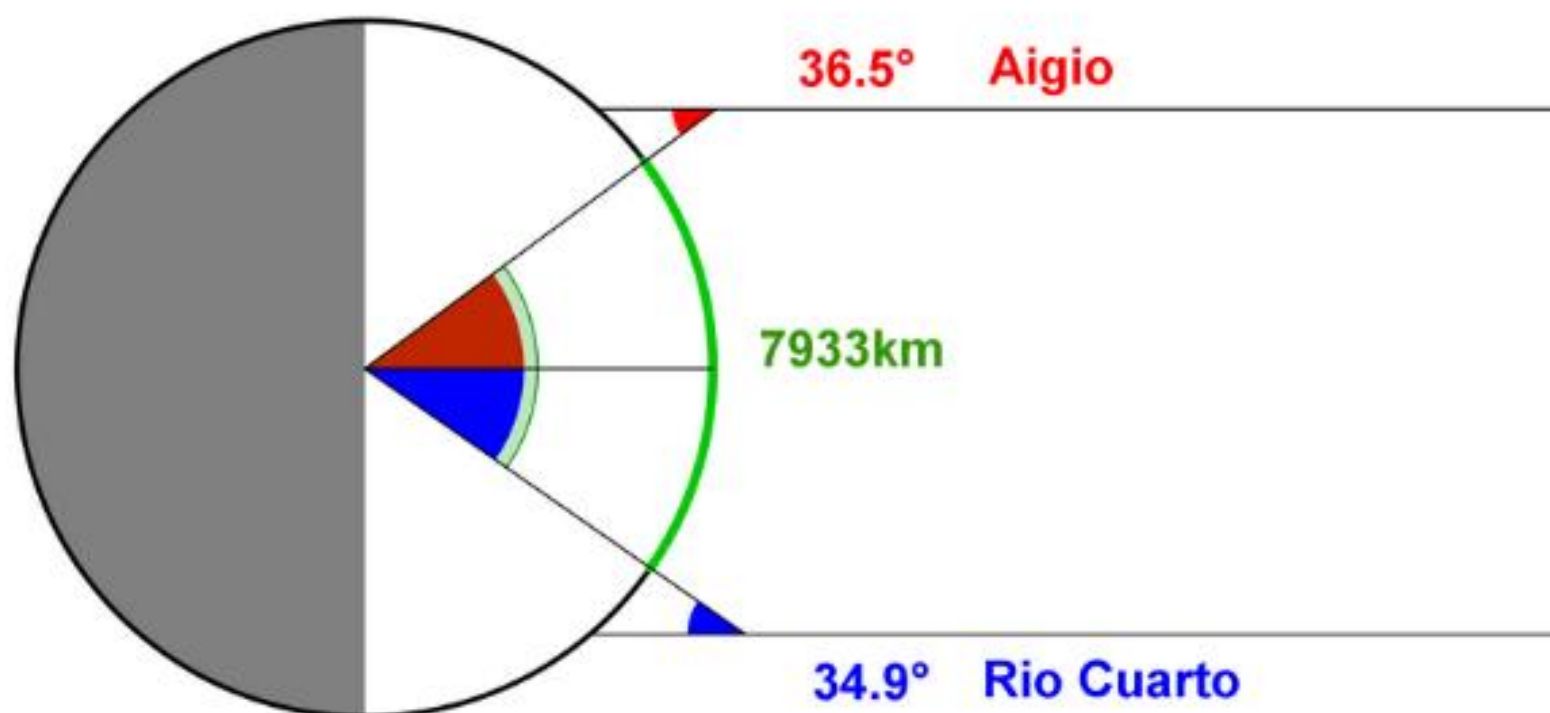


| Flag                                                                             | City       | Country   | School                            | Latitude (°) +N/-S | Longitude (°) +E/-W |
|----------------------------------------------------------------------------------|------------|-----------|-----------------------------------|--------------------|---------------------|
|  | Rio Cuarto | Argentina | IPEM No 79 "Ing. Renato de Marco" | -33.151            | -64.341             |

| Date         | Gnomon  | Shadow   | Angle   |
|--------------|---------|----------|---------|
| 18 September | 38 cm   | -26.5 cm | -34.9 ° |
| 25 September | 36.9 cm | -23.9 cm | -32.9 ° |

**18/9/2017 (Aigio-Greece) Latitude: 38.252°**

**18/09/2017 (Rio Cuarto-Argentina) Latitude: -33.151°**



$$\text{circumference} = \frac{360^\circ \times 7933\text{km}}{36.5^\circ + 34.9^\circ} = 39998 \text{ km}$$



# Rio Cuarto Concordia, Argentina

September 2017

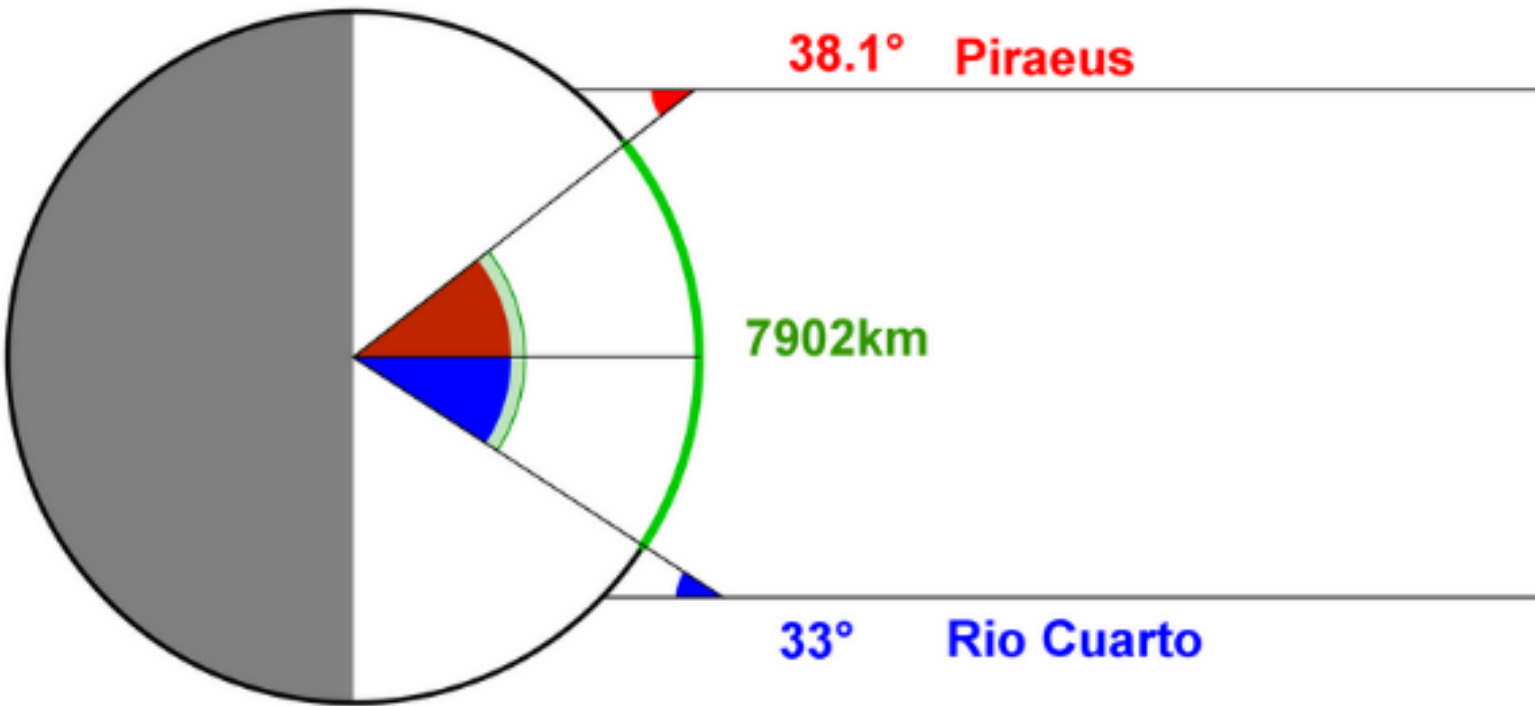


| Flag                                                                             | City       | Country   | School            | Latitude (°) +N/-S | Longitude (°) +E/-W |
|----------------------------------------------------------------------------------|------------|-----------|-------------------|--------------------|---------------------|
|  | Rio Cuarto | Argentina | Colegio Concordia | -33.149            | -64.351             |

| Date         | Gnomon  | Shadow   | Angle   |
|--------------|---------|----------|---------|
| 06 September | 53.5 cm | -43.4 cm | -39 °   |
| 12 September | 53.5 cm | -40.1 cm | -36.9 ° |
| 15 September | 53.5 cm | -37.2 cm | -34.8 ° |
| 21 September | 53.5 cm | -34.7 cm | -33.0 ° |
| 22 September | 53.5 cm | -34.7 cm | -33.0 ° |

22/9/2017 (Piraeus-Greece) Latitude: 37.977°

22/09/2017 (Rio Cuarto-Argentina) Latitude: -33.149°



circumference =  $\frac{360^\circ \times 7902\text{km}}{38.1^\circ + 33^\circ} = 40010 \text{ km}$



# Rio de Janeiro CEE, Brazil

September 2017

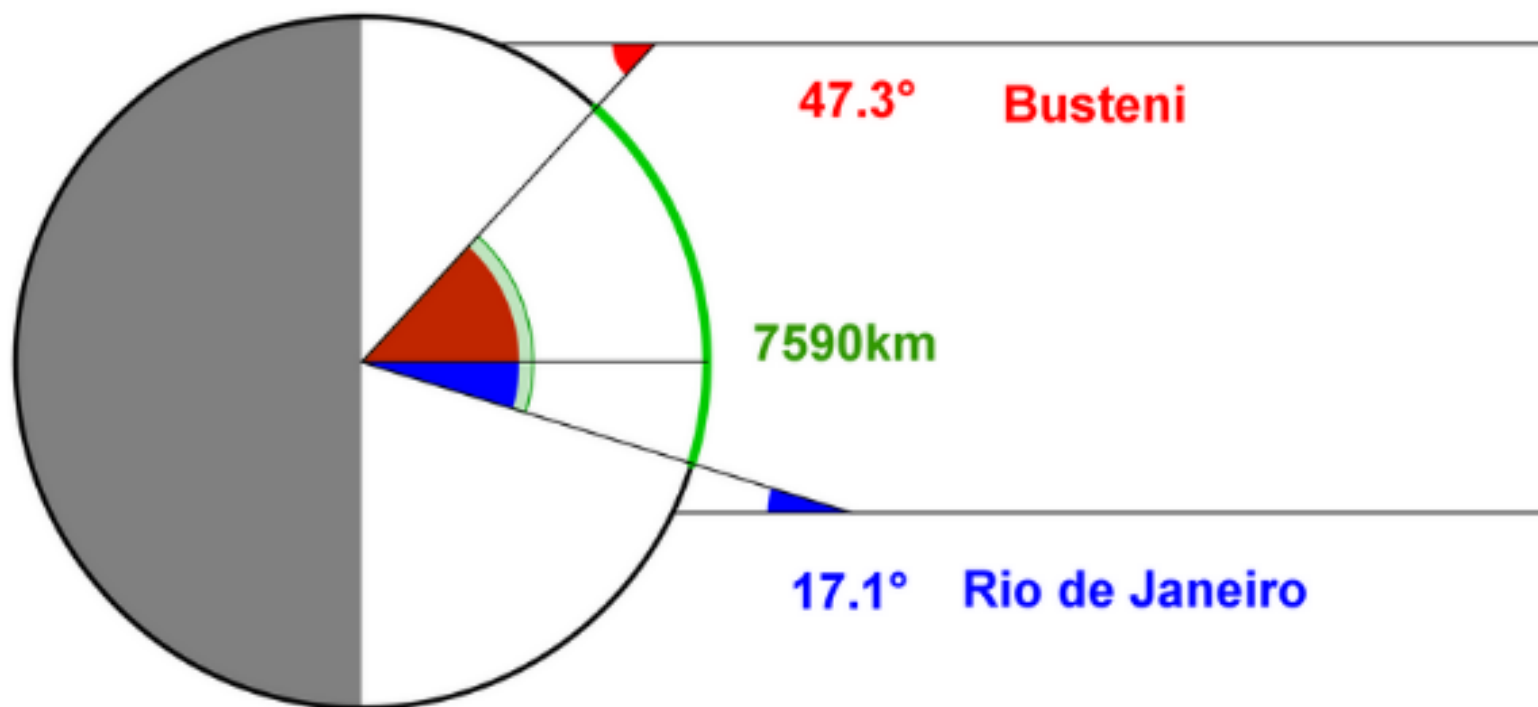


| Flag                                                                             | City           | Country | School                        | Latitude (°) +N/-S | Longitude (°) +E/-W |
|----------------------------------------------------------------------------------|----------------|---------|-------------------------------|--------------------|---------------------|
|  | Rio de Janeiro | Brazil  | Conselho Estadual de Educação | -22.881            | -43.382             |

| Date         | Gnomon  | Shadow | Angle   |
|--------------|---------|--------|---------|
| 27 September | 19.5 cm | -6 cm  | -17.1 ° |

27/09/2017 (Busteni-Romania) Latitude: 45.416°

27/09/2017 (Rio de Janeiro-Brazil) Latitude: -22.905°



$$\text{circumference} = \frac{360^\circ \times 7590\text{km}}{47.3^\circ + 17.1^\circ} = 42429 \text{ km}$$



# Rio de Janeiro CENOM, Brazil

September 2017

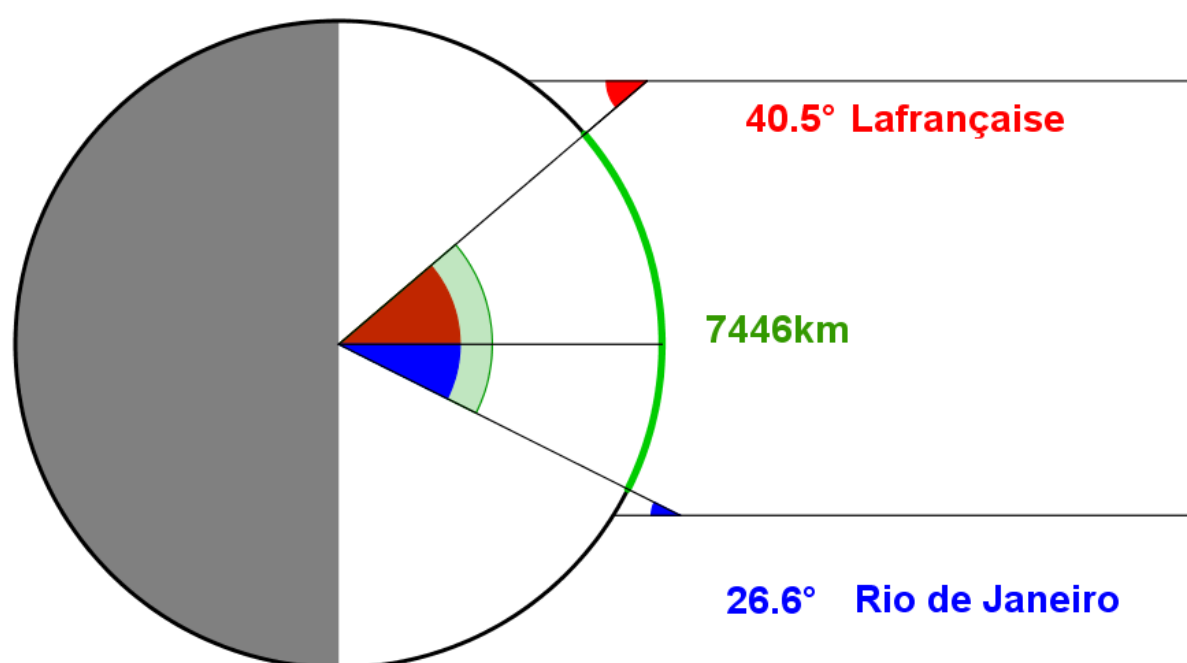


| Flag                                                                             | City           | Country | School                         | Latitude (°) +N/-S | Longitude (°) +E/-W |
|----------------------------------------------------------------------------------|----------------|---------|--------------------------------|--------------------|-----------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

| Date         | Gnomon | Shadow | Angle   |
|--------------|--------|--------|---------|
| 04 September | 100 cm | -60 cm | -31 °   |
| 05 September | 100 cm | -56 cm | -29.2 ° |
| 06 September | 100 cm | -57 cm | -29.7 ° |
| 11 September | 100 cm | -50 cm | -26.6 ° |
| 12 September | 100 cm | -50 cm | -26.6 ° |
| 13 September | 100 cm | -50 cm | -26.6 ° |
| 14 September | 100 cm | -50 cm | -26.6 ° |
| 15 September | 100 cm | -48 cm | -25.6 ° |
| 18 September | 100 cm | -48 cm | -25.6 ° |
| 19 September | 100 cm | -48 cm | -25.6 ° |
| 20 September | 100 cm | -46 cm | -24.7 ° |
| 21 September | 100 cm | -44 cm | -23.7 ° |
| 22 September | 100 cm | -44 cm | -23.7 ° |
| 25 September | 100 cm | -44 cm | -23.7 ° |
| 26 September | 100 cm | -44 cm | -23.7 ° |
| 28 September | 100 cm | -44 cm | -23.7 ° |

14/09/2017 (Lafrançaise-France) Latitude: 44.127°

14/09/2017 (Rio de Janeiro-Brazil) Latitude: -22.89°



$$\text{circumference} = \frac{360^\circ \times 7446\text{km}}{40.5^\circ + 26.6^\circ} = 39949 \text{ km}$$



# Rio de Janeiro Méier, Brazil

September 2017

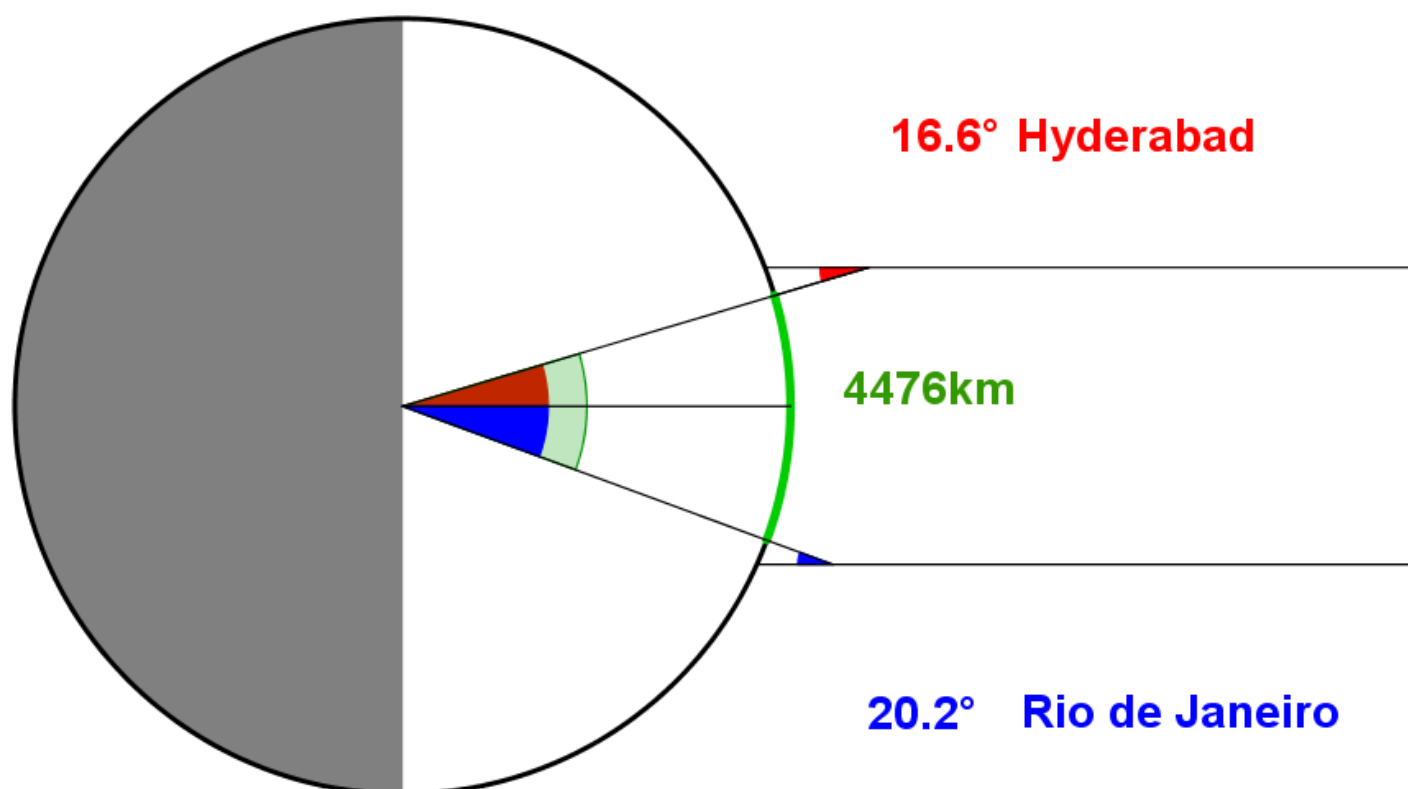


| Flag                                                                             | City           | Country | School                                | Latitude (°)<br>+N/-S | Longitude (°)<br>+E/-W |
|----------------------------------------------------------------------------------|----------------|---------|---------------------------------------|-----------------------|------------------------|
|  | Rio de Janeiro | Brazil  | Escola Municipal Bento Ribeiro, Méier | -22.904               | -43.280                |

| Date         | Gnomon | Shadow | Angle   |
|--------------|--------|--------|---------|
| 23 September | 19 cm  | -7 cm  | -20.2 ° |

**23/09/2017 (Hyderabad-India) Latitude: 17.385°**

**23/09/2017 (Rio de Janeiro-Brazil) Latitude: -22.904°**



$$\text{circumference} = \frac{360^\circ \times 4476\text{km}}{16.6^\circ + 20.2^\circ} = 43787 \text{ km}$$



# Úbeda, Spain

March 2017

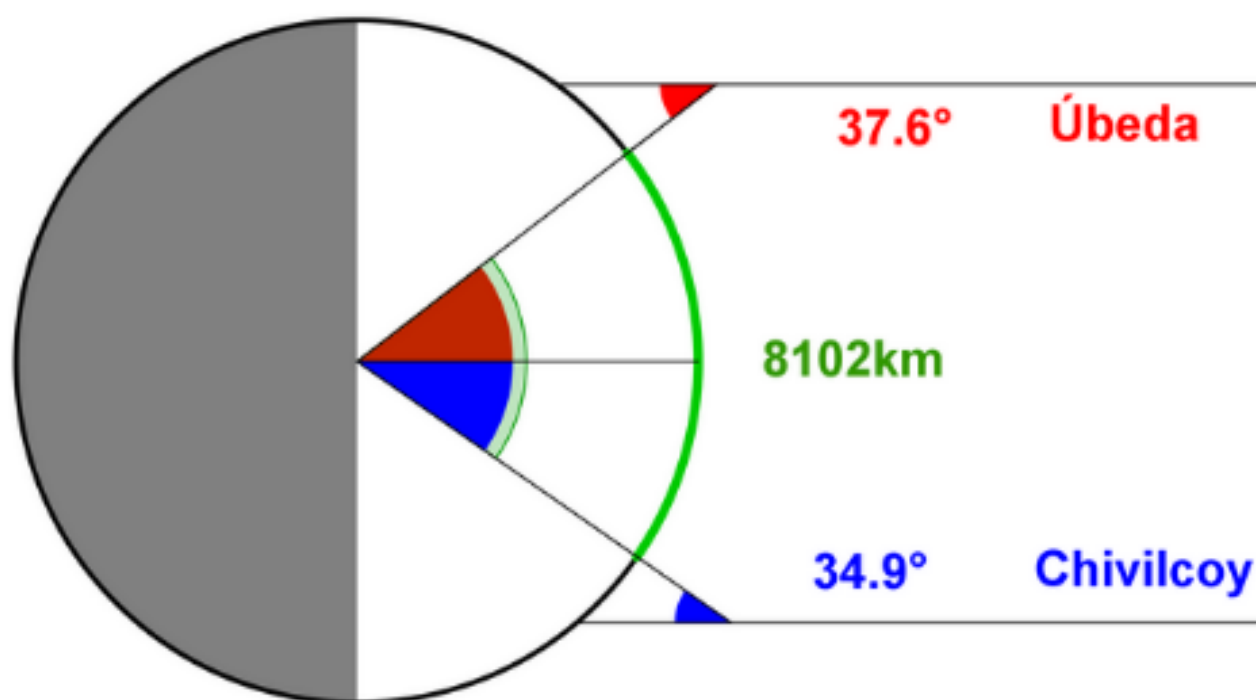


| Flag                                                                             | City  | Country | School                                | Latitude (°) +N/-S | Longitude (°) +E/-W |
|----------------------------------------------------------------------------------|-------|---------|---------------------------------------|--------------------|---------------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

| Date     | Gnomon | Shadow  | Angle  |
|----------|--------|---------|--------|
| 21 March | 114 cm | 87.9 cm | 37.6 ° |

22/09/2017 (Úbeda-Spain) Latitude: 38.017°

22/09/2017 (Chivilcoy-Argentina) Latitude: -34.911°



$$\text{circumference} = \frac{360^\circ \times 8102\text{km}}{37.6^\circ + 34.9^\circ} = 40231 \text{ km}$$



# Yamunanagar, India

September 2017

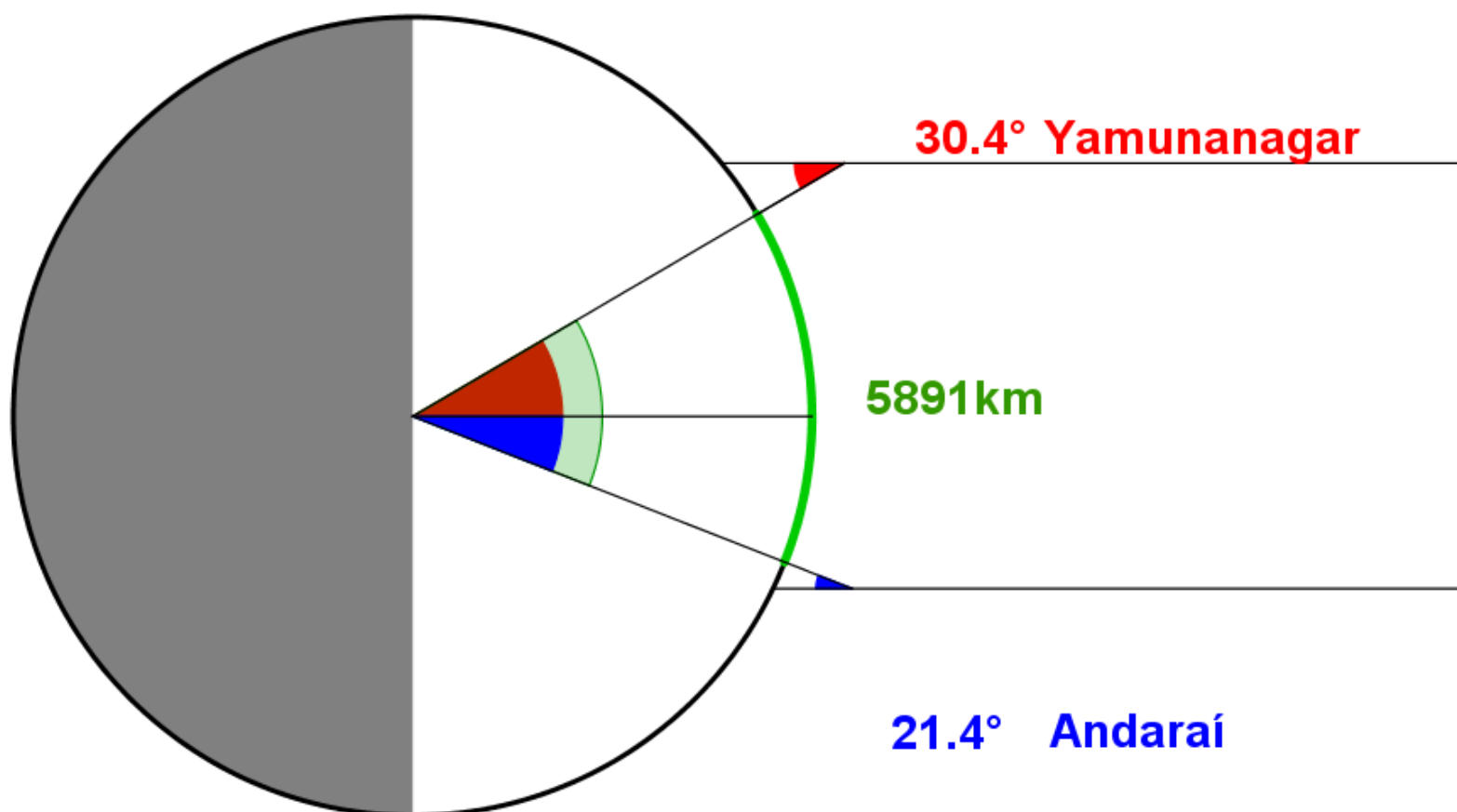


| Flag                                                                             | City        | Country | School                 | Latitude (°) +N/-S | Longitude (°) +E/-W |
|----------------------------------------------------------------------------------|-------------|---------|------------------------|--------------------|---------------------|
|  | Yamunanagar | India   | C V Raman Science Club | 30.117             | 77.250              |

| Date         | Gnomon | Shadow  | Angle  |
|--------------|--------|---------|--------|
| 24 September | 28 cm  | 16.4 cm | 30.4 ° |

**24/09/2017 (Yamunanagar-India) Latitude: 30.133°**

**24/09/2017 (Andaraí-Brazil) Latitude: -22.889°**



$$\text{circumference} = \frac{360^\circ \times 5891\text{km}}{30.4^\circ + 21.4^\circ} = 40941 \text{ km}$$



