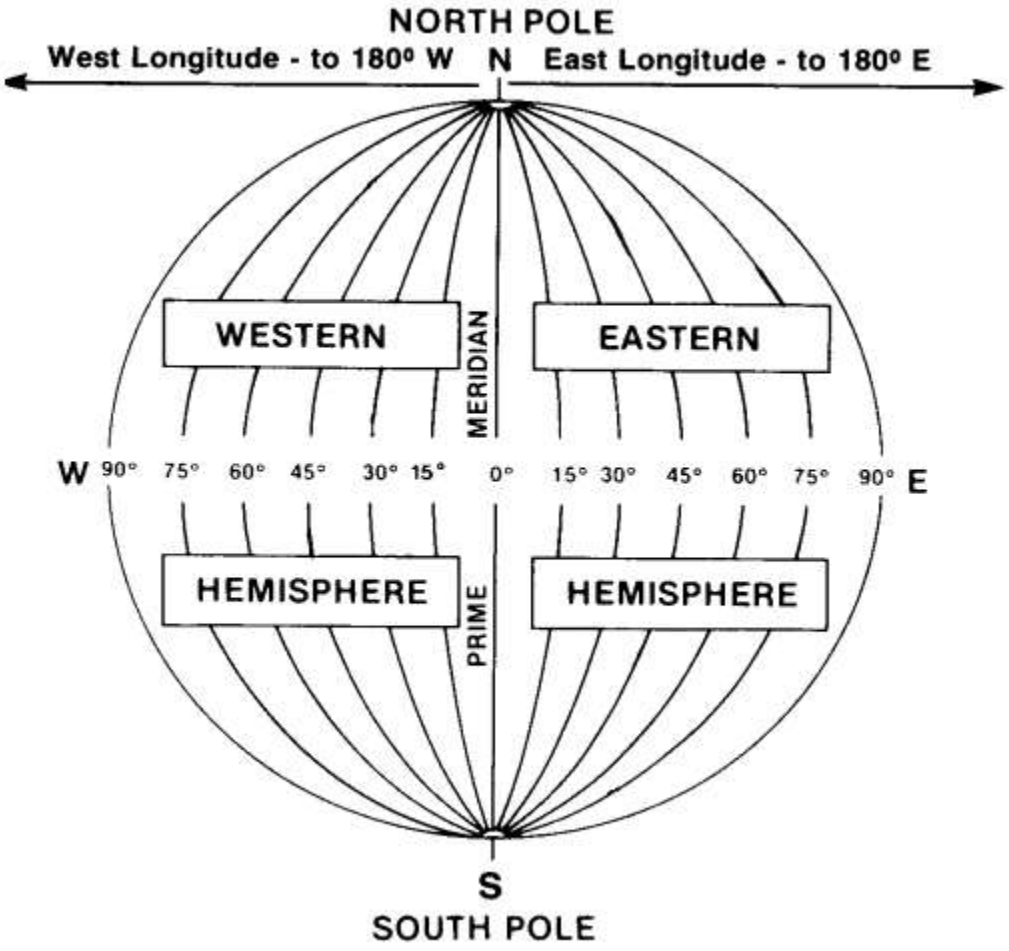
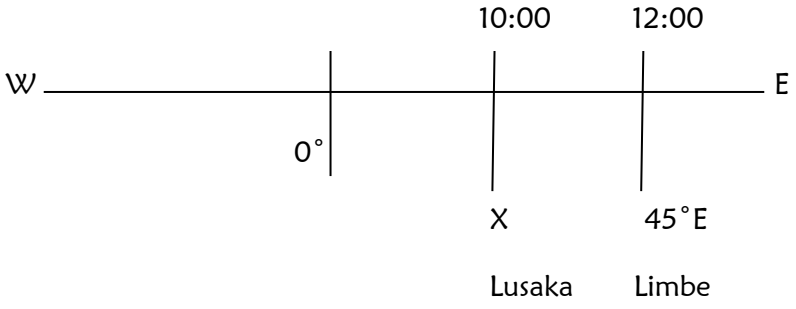
MATHEMATICAL GEOGRAPHY

Q1. Draw and label a longitude of 60°W and another 30°W.



Q2. State the longitude of Lusaka if the local time is 10:00 hours while Limbe 45°E with local time at 12:00?



Therefore; = 12:00-10:00 = 2:00

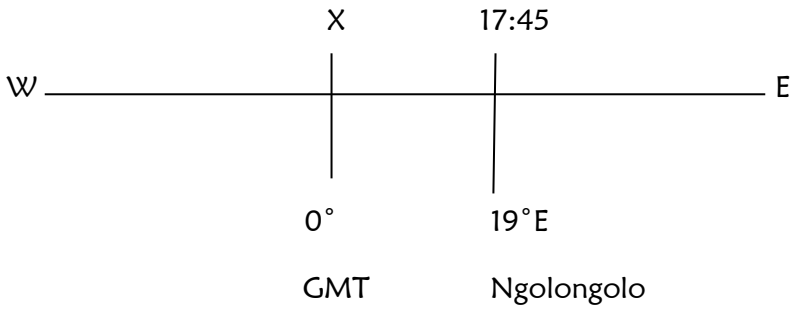
= if 1 hour = 15˚
4 minutes = 1˚

= 1 hour = 15˚
2 hours = X˚

=X1hour = 2hours x 15˚

= X =30˚E so Lusaka is 30˚E

Q3. The local time at Ngolongolo, Tanzania is 17:45 hours its location is 90˚E. What is the time at GMT?



Therefore; = 0˚ + 19˚E = 19˚

= if 1 hour = 15˚
4 minutes = 1˚

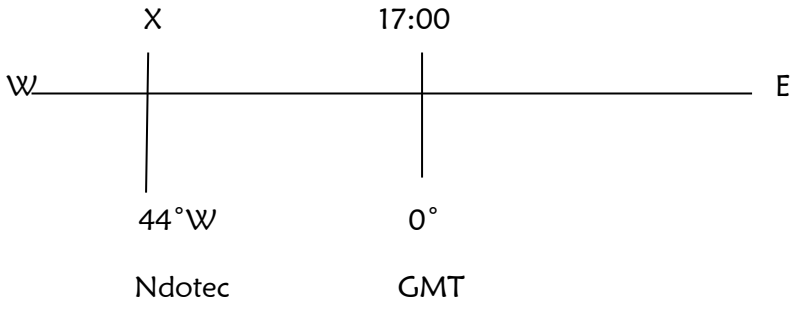
= 1 hour = 15˚
X = 19˚

=X15˚ = 19˚ = 1 hour (remainder 4˚ x 4 minutes =16 minutes) **1hour 16 minutes**
15˚ 15˚

= 17:45 hours
- 01:16minutes
16:29minutes

= X =16:29hours so GMT time is 16:29 hours

Q4. Ndotec University is located at longitude 44°W of Kaliako market. Every 17:00 hours GMT Ndotec University is on air to broadcast live TV quiz show. What local time is quiz?



Therefore; = 44° - 0° = 44°

= if 1 hour = 15°
4 minutes = 1°

= 1 hour = 15°
X = 44°

=X15° = 44°
15° 15°

= 2 hour (remainder 14° x 4 minutes =56 minutes) **2hour 56 minutes**

16:60minutes
= 17:00 hours
- 02:56 minutes
14:04minutes

= **X =14:04hours so Ndotec time is 14:04 hours**

Q5. What is the angle of elevation of the midday sun Berlin 46°N when it is 22nd December?

Formula: Constant Angle = (known angle – degree of occurrence)

$90° = (46°N + 23\frac{1}{2}°S)$

$90° = 69\frac{1}{2}°$

89.10-69.05
$= 90° - 69\frac{1}{2}°$
$= \underline{20\frac{1}{2}°}$ **So angle of elevation of the midday sun is $20\frac{1}{2}°$**

Q6. The new Ndola international airport is about 3663km Cairo international airport. If the Ndola airport is 8°S, What is the latitude of the Cairo airport?

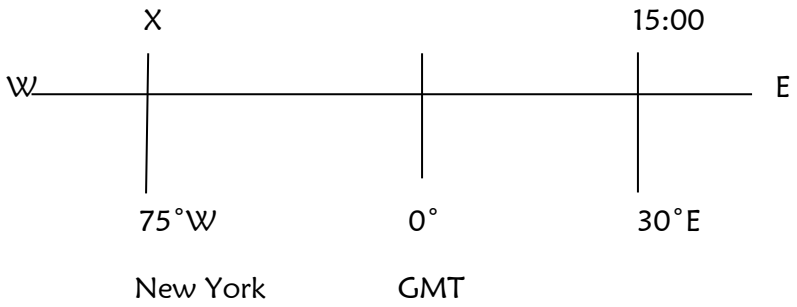
Therefore; = if 1° = 111km

= 1° = 111km
X = 3663km

=X111km = 3663km
111km 111km

=**33°N so the latitude of Cairo airport is 33°N**

Q7. The plane carrying the Chipolopolo boys to play a match in New York 75°W leaves Lusaka 30°E at 15:00 hours and takes 4 hours to fly. What will be the local time for the plane to reach New York?



Therefore; = 75°+ 30° = 105°

= if 1 hour = 15°
4 minutes = 1°

= 1 hour = 15°
X = 105°

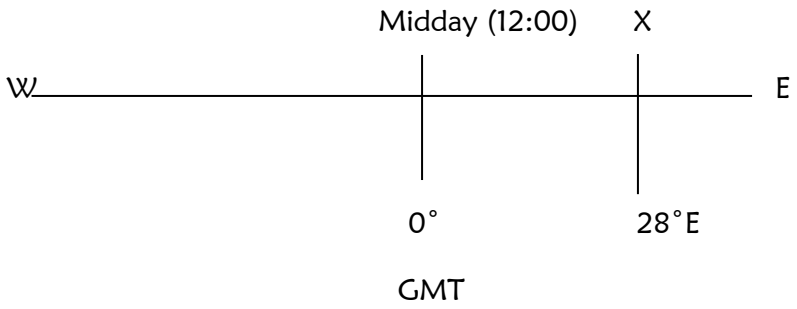
=X15° = 105° = 7 hour
15° 15°

= 15:00 hours
- 07:00 minutes
08:00

= X =08:00hours so New York time is 08:00 hours

Q8. **Which latitude has the longest day in the summer solstice?** Tropic of Cancer ($23\frac{1}{2}$°N)

Q9. What is the local time of 28°E when it is midday in London?



Therefore; = 0°+ 28° = 28°

= if 1 hour = 15°
4 minutes = 1°

= 1 hour = 15°
X = 28°

=X15° = 28° = 1 hour (remainder 13° x 4 minutes =52 minutes) **1hour 52 minutes**
15° 15°

= 12:00 hours
+01:52 minutes
13:52

= X =13:52hours so local time is 13:52 hours

Q10. Budapest (Hungary) and Cape Town (South Africa) lie along the same median 180°E. Budapest lies at 47°N while Cape Town lies at 33°S. What is the approximate distance between them?

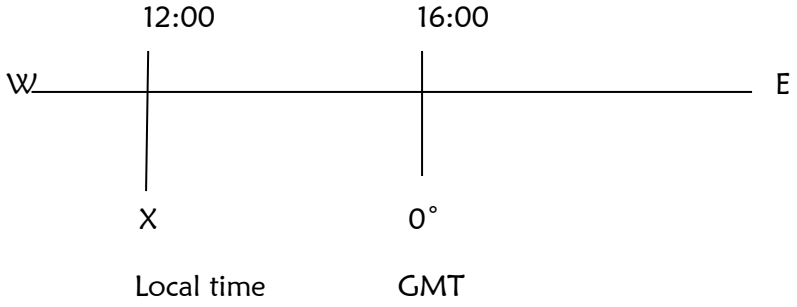
Therefore; = if 1° = 111km

= 47°N + 33°S =80°

= 80° X 111

=8880km, so the distance between them is 8880km

Q11. What is the longitude of a place whose local time is 12:00 hours when Greenwich Time is 16:00hours?



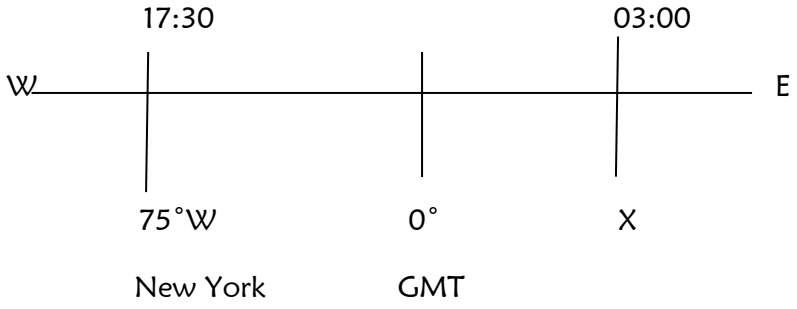
Therefore; = 16:00 – 12:00 = 04:00hours

= if 1 hour = 15°
4 minutes = 1°

=04:00hours x 15°

= **60°W** **so longitude is 60°W**

Q12. At 17:30 hour's people watching CNN television in New York, 75°W USA saw a live broadcast of a disaster rescue operation at 03:00 hours. What was the longitude at the rescue center?



Therefore; = 17:30 + 03:00 = 20:30hours

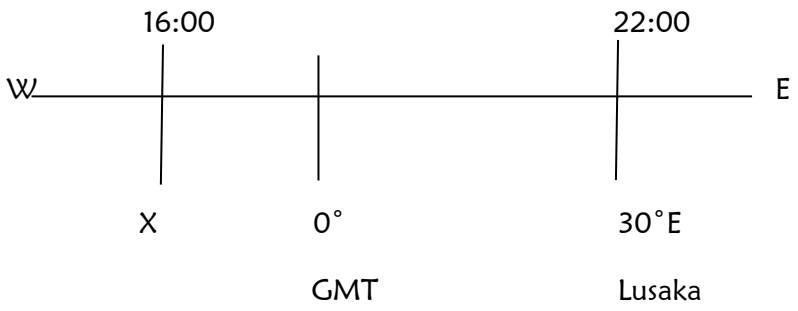
= if 1 hour = 15°
4 minutes = 1°

=(20:00hours x 15°) + (30minutes ÷4minutes)

= 300 + $7\frac{1}{2}°$

= **$307\frac{1}{2}°$E** **so longitude is $307\frac{1}{2}°$E**

Q13. At 22:00 hours people watching in Lusaka Zambia (30°E) saw a live broadcast of a boxing match at 16:00 local time. What was the local time for the ship?



Therefore; = 22:00 - 16:00 = 06:00hours

= if 1 hour = 15°
4 minutes = 1°

=06:00hours x 15°

= **90°W** so longitude is **90°W**

Q14. At what latitude is the angle of elevation 90° at noon on 22nd December?

Formula: Constant Angle = (known angle – degree of occurrence)

$90° = (90° - 23\frac{1}{2}°S)$

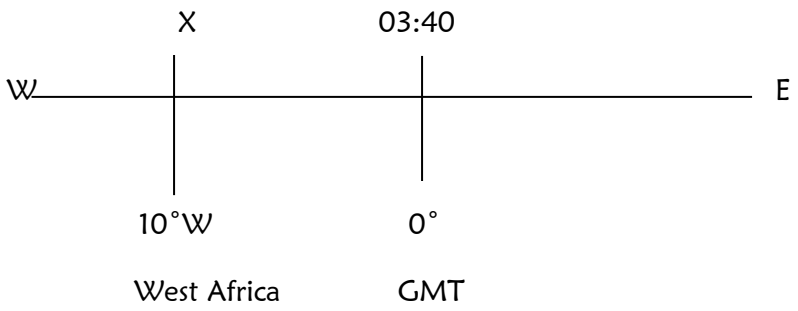
$90° = 66\frac{1}{2}°$

89.10-66.05

$= 90° - 66\frac{1}{2}°$

$= \underline{\mathbf{23\frac{1}{2}°}}$ **So latitude is** $\underline{\mathbf{23\frac{1}{2}°}}$

Q15. An important announcement was broadcasted from London at 03:40 Pm GMT when a navigator ship anchored off the coast of West Africa is longitude 10°W. What was the local time for the ship?



Therefore; = 10°- 0° = 10°

= if 1 hour = 15°
4 minutes = 1°

= 1 hour = 15°
X = 10°

=X15° = 10° = 0 hour (remainder 10° x 4 minutes =40 minutes) **0hour 40 minutes**
15° 15°

= 03:40 hours
-00:40 minutes
03:00

= X =03:00hours so local time is 03:00 hours

Q16. What would be the angle of elevation for a country along the latitude 60°N when the sun is overhead on the tropic of cancer?

Formula: Constant Angle = (known angle – degree of occurrence)

$90° = (60°N - 23\frac{1}{2}°N)$

$90° = 36\frac{1}{2}°$

89.10-36.05
$= 90° - 36\frac{1}{2}°$
$= \underline{53\frac{1}{2}°}$ **So angle of elevation is $53\frac{1}{2}°$**

Q17. What is the approximate distance on the actual ground in a straight line between Cairo 30°N and Durban 29°S?

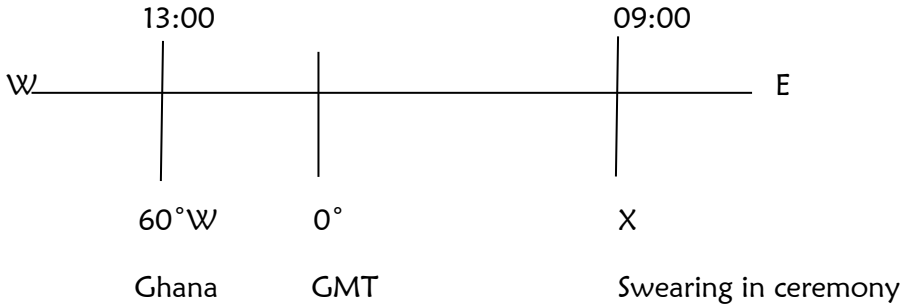
Therefore; = if 1° = 111km

= 30°N + 29°S

= 59° x 111km

=6549km so the approximate distance is 6549km.

Q18. At 13:00 hours local time people in Ghana 60°W were on a live WhatsApp broadcast of swearing in ceremony of a new elected president in a country where the local time is 09:00 hours. What is the longitude of the place where the ceremony was taking place?



Therefore; = 13:00 + 09:00 = 22:00hours

= if 1 hour = 15°
4 minutes = 1°

=22:00hours x 15°

= **330°E** <u>so longitude is</u> **330°E**