مباراة للتعاقد على بعض المهام للعمل لدى

وزارة الثقافة – المديرية العامة للآثار.

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لمهام مهندس طوبوغراف

مسابقة خطية في الاختصاص المطلوب باحدى اللغتين الفرنسية والانكليزية.   **الوقت:** ثلاث ساعات
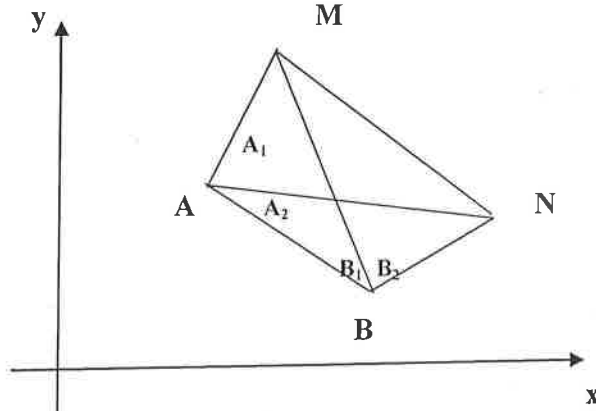
Topo metric calculus

By measurement of horizontal angles we find the next table:

Measured angle	Angle value (grad)
A_1	72.236
A_2	34.572
B_1	42.618
B_2	65.925

The coordinates of points A and B are:

Point	X (m)	Y (m)
A	312.75	975.65
B	827.37	346.18

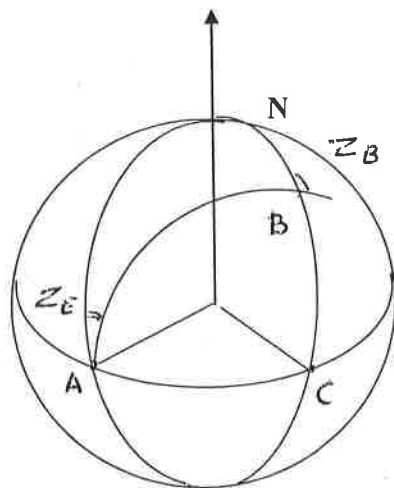a) Find the coordinates X and Y of points M and N.
b) Find the area of the polygon ABNM.

Geodesy

On the equator of a sphere, the point A has $\lambda_A = 20°$, and the point C has $\lambda_C = 70°$.

A geodesic AB cross the meridian of point C at point B, and makes an azimuth at point A: $Z_E = 40°$.

a) Find the azimuth of the geodesic AB at point B.
b) If the radius of the sphere is 6373 km find the length (in km) of the geodesic AB.

Photogrammetry

A mission of taking pictures has the following information:

- Size of the photo 18*18 cm
- Overlapping between photos 67%
- Overlapping between strips 18%
- Camera principle distance c = 152 mm
- Scale of photos E = 1/ 10 000
- Speed of the aircraft 350 km/h
- Speed of the wind 60 km/h
- Bearing of the aircraft axis 30°
- Bearing of the wind 60 km/h
- Speed of the camera shutter 1/300 sec

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Find

a) The flying height
b) The distance d_1 between two successive centers of photos: on the photo and on the terrain.
c) The distance d_2 between two successive strips axes: on the photo and on the terrain.
d) The value R and the bearing of the real speed of the aircraft.
e) The trail effect on the photo and on the terrain. Is it acceptable?
f) The area of the terrain covered by two strips, each strip has 4 photos: the area is limited by the external borders of all photos.

Map projection

In the conformable conical projection (Lambert) used in France, we have:

- $\varphi_0 = 49$ grad
- $\lambda_0 = 2.59$ grad East
- $a = 6378249.2$ m
- $e^2 = 0.006\ 803\ 487$
- $m_L = 0.9998774$.

A point M has $\varphi_M = 49.9$ grad North, and $\lambda_M = 3.42$ grad East.

Find N_0, Ro, $\pounds_0$, $\pounds$, R, then the coordinates X and Y of point M,[knowing that

$\pounds = \ln \tan(\pi/4 + \varphi/2) - (e/2)(1+ e \sin \varphi)/(1- e \sin \varphi)]$

Theory of errors

The measured angles around a point A are:

$x = 34°.44333$

$y = 165°.13167$

$z = 160°.42667$

Find the most probable value of each of the three angles by the least squares method, using the matrix method.

GPS

(true or false. If false give the right answer)

1 – Carrier waves L1 and L2 are modulated by C / A codes and Pcode.

2- Perigee is the point of the satellite closest to the earth

3-the fourth satellite is needed for non-synchronization between satellite receivers.

4-the inclination of the orbit of the GPS satellites is 55 °.

5 - sidereal time is defined by the hour angle of vernal equinox

6- the GPS satellite positioning based on the principle of triangulation

7-the altitude of GPS satellite is about 26500km.

8-the fundamental frequency of the signals from GPS satellites is 1.023mhz

9-the complete content of broadcast message is transmitted in 30min.

10-Selective Availability (SA) was removed May 2, 2002. ?

11– The navigation message is modulated only on the carrier (L2).

12-GPS satellite visibility is repeated about 4 minutes earlier each day?

Multiple choice questions (MCQ

1. **A GIS can be defined as:**
   a) An information system used to manipulate, summarize, query, edit, and visualize spatial data
   b) A set of tools for collecting, storing, retrieving, transforming, and displaying spatial data
   c) (a) and (b)
   d) None is correct

2. **Most important components of a GIS is:**
   a) highwire
   b) astroware
   c) alienware
   d) software

3. **_____ are "data about the data".**
   a) megadata
   b) metadata
   c) more data
   d) dated data

4. **The market leader maker of the most commonly used GIS software is _____.**
   a) Environmental Systems Research Institute (ESRI)
   b) Manifold
   c) Intergraph
   d) MapInfo

5. _____ enables workers in the field to capture, store, analyze, update, and display geographic information.
   a) Remote sensing
   b) GIS
   c) Level
   d) Total station

6. If two maps are to be overlain with a GIS they should have identical
   a) North arrow
   b) legends
   c) coordinate systems

   All answers are correct

7. The term resolution with reference to a raster or grid data model, is defined in terms of
   a) The map length of a single pixel side.
   b) The ground area of a single cell or pixel.
   c) The map length of the smallest feature.
   d) The ground length of the typical feature.

8. In the vector data model stores:
   a) Points, lines, and areas.
   b) Pixels, nodes, and bytes.
   c) Areas, polygons, and zones.
   d) Nodes, points, and dots.

9. Data entry errors referred to as slivers can occur for which of the following types of data?
   a) None are correct.
   b) Raster's
   c) Polygons
   d) Points

10. The values of an attribute for a record
   a) All answers are correct.
   b) Can be text.
   c) Can be numbers.
   d) Can be coded as missing.

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اللجنة الفاحصة