

Observing competition – planetarium round

Solutions and points

Dotyczy pokazu na Planetaryjnym niebie w dniu 26.08.2011.

1. Earth

[total 25 p.]

- A) On the map of the sky, mark and label the nova and the Moon and draw the shape and position of the c

Nowa w Woźnicy, Księżyc w Byku pomiędzy Hiadami i Plejadami, kometa na granicy Bliźniąt i Woźnicy. [2 +1 + 3 = 6]

- B) In the table below, circle only those objects which are above the astronomical horizon.
[+0.5 for each correct, -1 for each incorrect]

M20 – Triffid Nebula	o Cet – Mira	δ CMa – Wezen
α Cyg – Deneb	M57 – Ring Nebula	β Per – Algol
δ Cep – Alrediph	α Boo – Arcturus	M44 – Praesepe (Beehive Cluster)

- C) When the coordinate grid is visible, mark on the map the northern part of the local meridian and the ecliptic north pole. [3 + 2 = 5]

- D) For the displayed sky, give the :

geographical latitude of the observer : $\varphi = 50^\circ \pm 1^\circ$, [1]

Local Sidereal Time : $\theta = 5^h 25^m \pm 8^m$, [2]

time of year, by circling the calendar month :

Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct, Nov, Dec.

Jan or Feb (data odtwarzana przea aparaturę, to 28 Jan) [2]

- E) Give the names of the objects, whose approximate horizontal coordinates are :

azimuth $A_1 = 45^\circ$ and altitude $h_1 = 58^\circ$: . . . **M 45 (Pleiades)**, [1]

azimuth $A_2 = 278^\circ$ and altitude $h_2 = 20^\circ$: . . . **α Leo (Regulus)** [1]

- F) Give the horizontal coordinates (azimuth, altitude) of :

Syrius (α CMa) : $A_3 = 340^\circ \pm 2^\circ$, $h_3 = 20^\circ \pm 1^\circ$. . [0.5 + 0.5]

The Andromeda Galaxy (M31) : $A_4 = 108^\circ \pm 2^\circ$, $h_3 = 41^\circ \pm 2^\circ$. . [0.5 + 0.5]

G) Give the equatorial coordinates of the star marked on the sky with a red arrow :

Obiektem był Mirfak (α Per): $\alpha = 3^h 24^m \pm 15^m$; $\delta = 49^\circ \pm 3^\circ$ [1 + 1]

Po zidentyfikowaniu na mapce można określić współrzędne Mirfaka.

Mars

[total 25 p.]

H) Give the areographic (Martian) latitude of the observer : $\varphi = 22.5$ degrees [2]

I) Give the altitudes of upper h_u and lower h_l culmination of :

Pollux (β Gem) : $h_u = 61^\circ \pm 0.5^\circ$; $h_l = 50^\circ \pm 1^\circ \dots \dots$ (calculated) [1+2]

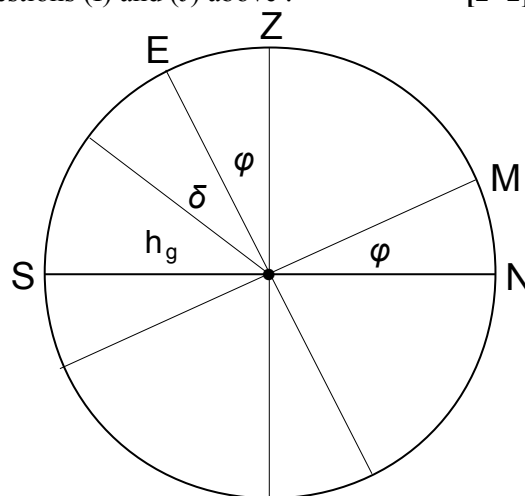
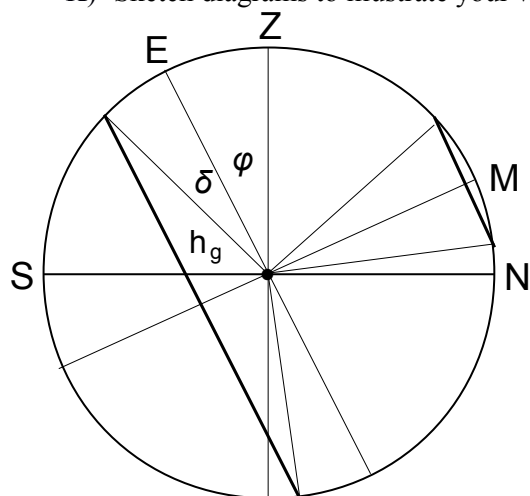
Deneb (α Cyg) $h_u = 32^\circ \pm 0.5^\circ$ $h_l = 13^\circ \pm 10.5^\circ$. [1+1]

J) Give the areocentric (Martian) right ascension and declination of :

Regulus (α Leo) $\delta = -22.5^\circ \pm 0.5^\circ$ z wysokości górowania: $h_u = 45^\circ \pm 0.5^\circ$ [2]

Toliman (α Cen) $\delta = -48^\circ \pm 0.5^\circ$ z wysokości górowania: $h_u = 19.5^\circ \pm 0.5^\circ$ [2]

K) Sketch diagrams to illustrate your working in questions (I) and (J) above : [2+2]



L) On the map of the sky, mark (with a cross) and label ("M") the Martian North Pole [2].

M) Give the azimuth of the direction in which the observer moved away from the Martian base :

$A = 330 - 180 = 150$ degrees. [2]

N) Estimate the location of the base on Mars, and circle the appropriate description :

a. near the Equator b. near the northern Tropic circle [3]

c. near the northern Arctic circle d. near the North Pole

- O) The time axis below shows the Martian year and the seasons in the northern hemisphere.
Mark the date represented by the planetarium display on the axis. [3]

