P1: Naked eye observation of the real sky with a panoramic 360-degree image

Instruction: Estimate the LST (Local Sidereal Time) at the time the image was taken, rounded to the nearest hour.

Included:

- Panoramic 360-degree image of the sky at night at an unknown location
- Computer screen
- Keypad to pan around the image
- Coordinates of bright stars

Name	Bayer Designation	Declination (Dec)	Right Ascension (RA)
Rigil Kentaurus	**α Cen**	–60° 50′ 02.3737″	14h 39m 36.5s
Arcturus	**α Boo**	+19° 10′ 56″	14h 15m 39.7s
Vega	**α Lyr**	+38° 47′ 01″	18h 36m 56.3s
Capella	**α Aur**	+45° 59′ 53″	05h 16m 41.4s
Altair	**α Aql**	+08° 52′ 06″	19h 50m 47.0s
Aldebaran	**α Tau**	+16° 30′ 33″	04h 35m 55.2s
Antares	**α Sco**	−26° 25′ 55″	16h 29m 24.5s
Spica	**α Vir**	−11° 09′ 41″	13h 25m 11.6s
Deneb	**α Cyg**	+45° 16′ 49″	20h 41m 25.9s
Dubhe	**α UMa**	+61° 45′ 04″	11h 03m 43.7s
Polaris	**α UMi**	+89° 15′ 51″	02h 31m 49.1s
Alpheratz	**α And**	+29° 05′ 26″	00h 08m 23.3s
Schedar	**α Cas**	+56° 32′ 14″	00h 40m 30.4s

LST of the image: _____

P2: Planet observation from the real sky with a panoramic 360-degree image

Instruction: Count the number of planets visible in this image above the horizon and name the constellations they're in (with IAU designations).

Included:

- A panoramic 360-degree image of the sky at night at an unknown location
- Computer screen
- Keypad to pan around the image

Number of Planets visible: _____

List the constellations (using their IAU designations, i.e. Ursa Major or UMa):

_____

P3: Analemma on another planet

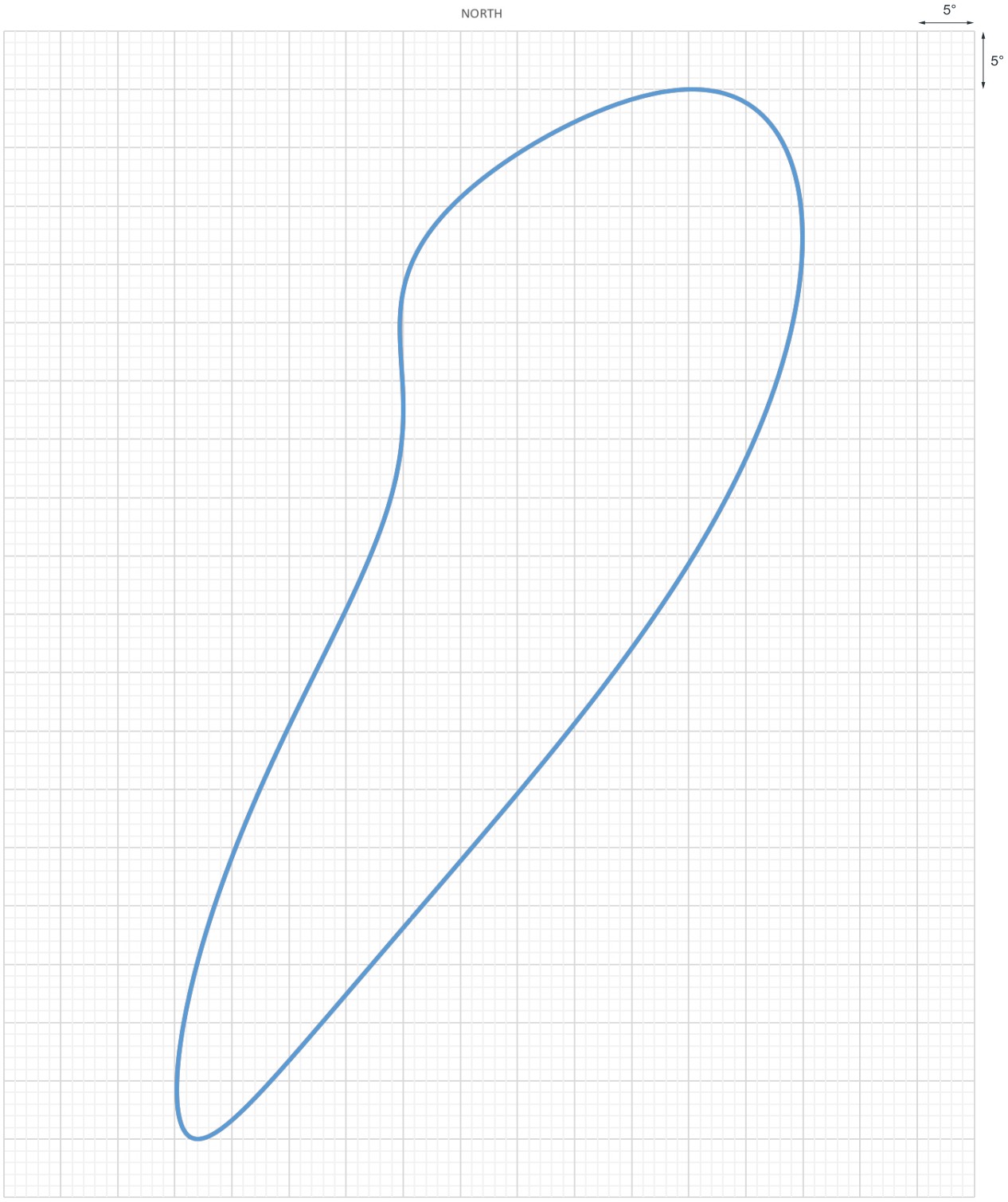
Instruction: Find the Obliquity (Axial Tilt) of the planet.

Included:

- A generated analemma (the position of a Star as viewed from the surface of a planet at intervals of the mean solar day of the planet over the orbital period of the planet) of a fictitious planet orbiting around a Star
- Result is plotted on a graph with each major grid representing 5°

The obliquity of the planet: _____

Analemma on Planet X



P4: Exposure time from a Photograph

Instruction: Estimate an exposure time of a given “Star Trails” image.

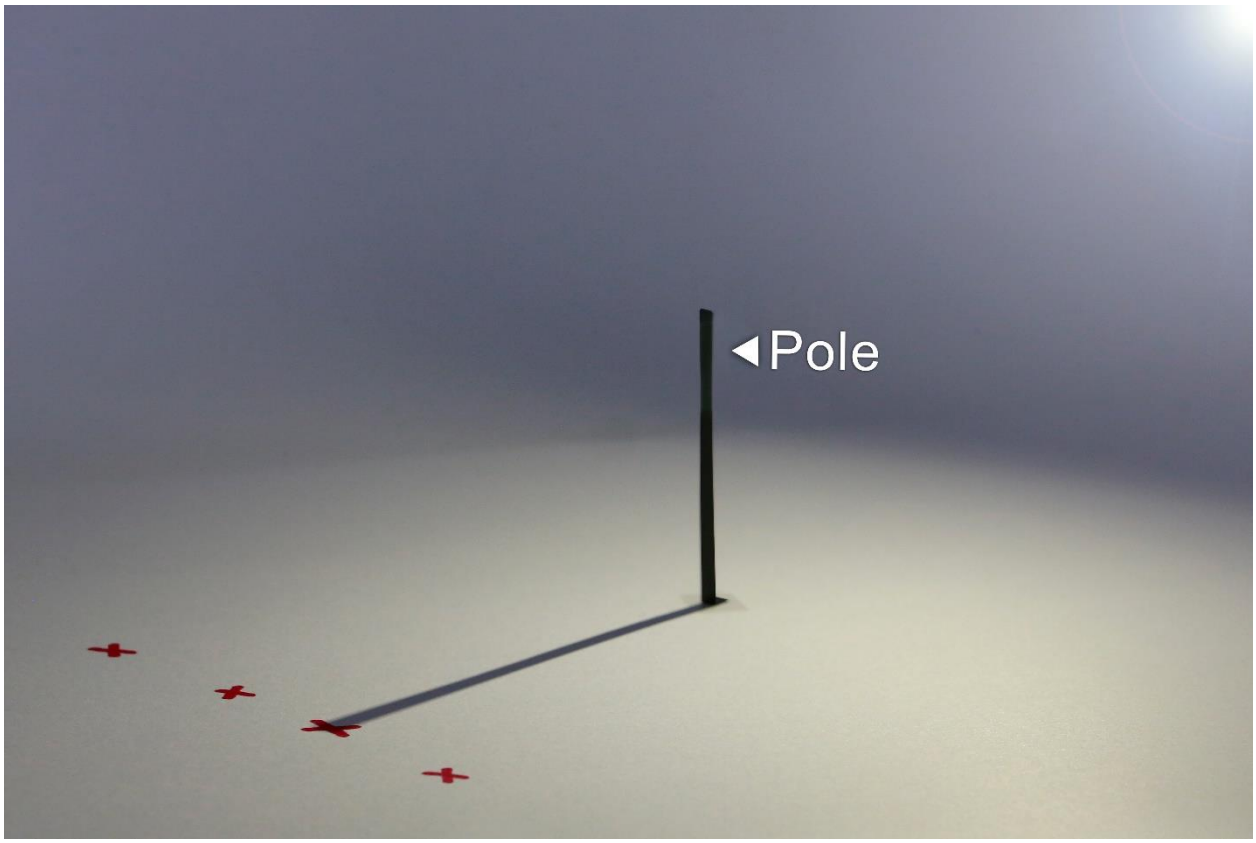
Included:

- A “Star Trails” image that was taken by a still camera capturing images over a period of time
- Ruler

Exposure time: _____

P5: Find True North from Moon shadow

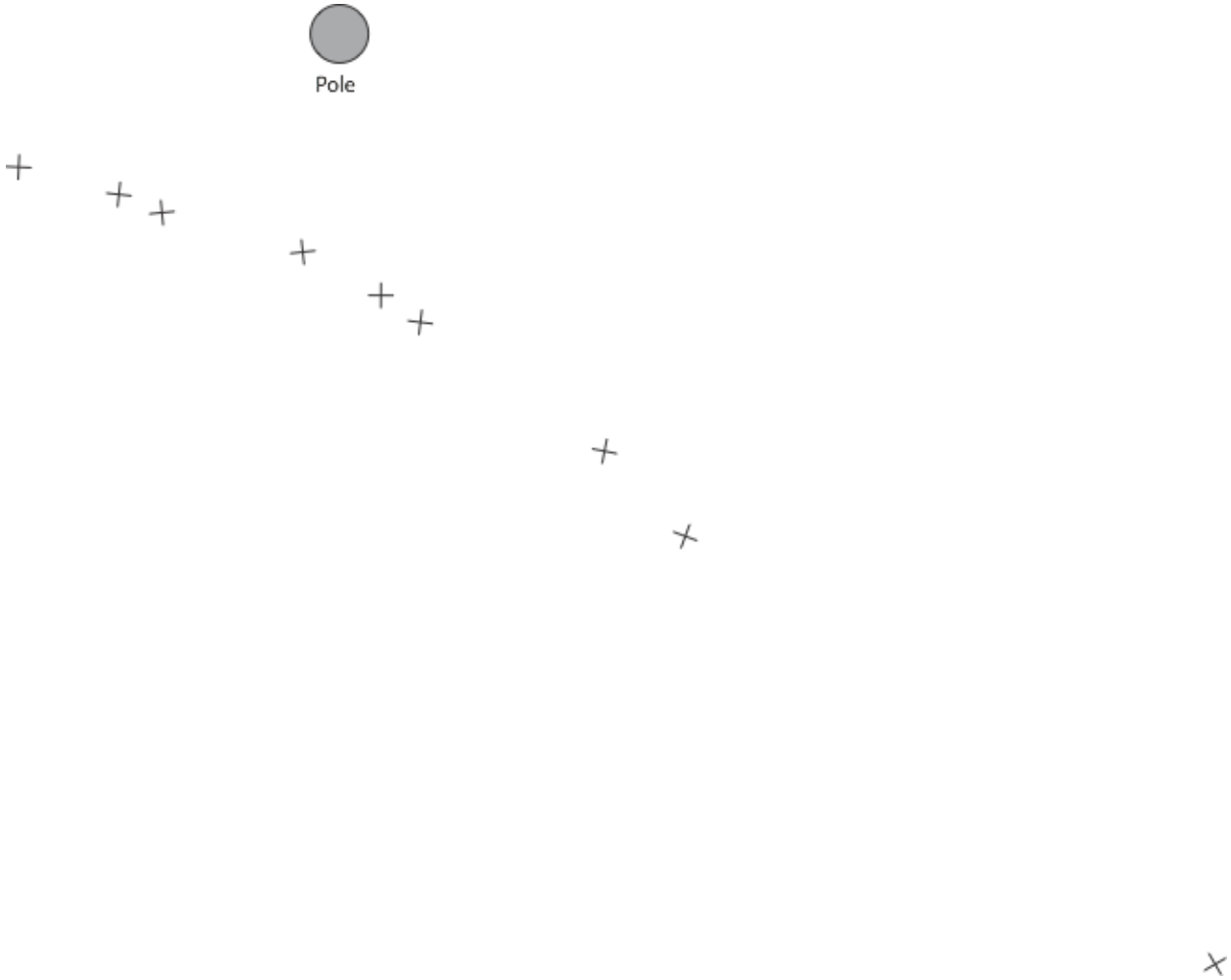
Instruction: Draw an arrow pointing North on the data sheet.



Included:

- Simulated position of moon shadows of a pole at certain intervals over a day
- The observer is located in the Southern hemisphere at latitude 27°S
- The moon's declination that night is +15°
- Ruler, Compass (drawing tool), Geometry kit

Data sheet



P6: Find Latitude from Equatorial Mount

Instruction: Without altering the polar alignment, find the observer's latitude based on a previously polar-aligned equatorial mount.

Included:

- An Equatorial Mount Telescope that has already been **properly** aligned to the northern celestial pole
- Spirit (bubble) level
- Latitude dial on the mount is covered (you may not use it)

Latitude: _____

P7: Precision Polar Alignment with Equatorial Mount

Instruction: Perform a polar alignment on the equatorial mount provided

Included:

- Equatorial Mount with polar scope (has not been polar aligned)
- Date and Time (GMT, UTC+0) at the moment of performing the polar alignment
- Diagram of the sky's position at the time
- A light source to act as a substitute for Polaris and used for proper polar alignment (already visible in the polar scope)
- Longitude of observer

Date and Time : 30 Aug 2017 / 23:30

Longitude: 10^{0} E