Sight Reduction

INSTRUCTIONS to derive computed altitude Hc:
Use the UTC of the moment when the altitude was measured with the sextant, nautical almanac, DR lat., and DR long. to derive the altitude Hc of the observed body based on where you think you are.
Determine Universal Coordinated Time (UTC) at the moment of sextant sighting.
Use UTC to locate GHA, declination, and SHA in the The Online Nautical Almanac or 2024 Nautical Almanac for the moment you take your sextant sighting.
GHA - Global/Greenwich Hour Angle of observed body
decl - declination of observed body
SHA - sidereal hour angle of observed star
Enter your estimated DR latitude and longitude.
The lat/lon of San Antonio is shown.
Click button to derive computed altitude Hc.
Take sextant sighting and derive Observed altitude Ho.

INSTRUCTIONS to derive observed altitude Ho:
What was the actual observed altitude Ho you measured with the sextant?
Enter the index error of sextant.
Enter the height of eye above sea level.
Enter the sextant altitude measurement.
Parallax is in the 2024 Nautical Almanac.
Semi-diameter is in the 2024 Nautical Almanac.

Compare Hc to Ho and convert difference (in minutes of a degree) to nautical miles toward or away from the observed body.
1' degree minute = 1 nautical mile.

How to test computed altitude Hc:
Use the night sky map at timeanddate.com to locate a body (Moon, planet, or star) in the San Antonio area.
Note the time and altitude for the body from the website.
Select the CST (Dallas) time zone from the tzone pulldown.
Click the UTC Time button to calculate the current UTC time.
Use the time to obtain GHA, declination [& SHA] from The Online Nautical Almanac.
Enter the GHA, declination [& SHA] almanac data for the current and next UTC hour into the web form.
Use the provided DR lat. and long. (29.424349 N, 98.491142 W) for Schertz,TX.
Click the Calc Hc button to compute compted altitude Hc.
Compare your Hc findings with the altitude listed at TimeandDate.com.

Computed Altitude (Hc)	Observed Altitude (Ho)
Calculate altitude based on nautical almanac body: star limb: select (Sun / Moon)	Calculate altitude based on sextant observation

name: Betelgeuse

UTC Time | Calc Hc | scroll dn

yyyy: 2024 mm: 2 **dd:** 21
hh: 5 mi: 10 ss: 57
observer's time zone: UTC-6 - Dallas (CST)
normal time.
Verify UTC at: Current UTC time
or WORLD TIME ZONE MAP

index error:		(-ie/+ie on/off the arc)
height of eye:		◉ feet ○ meters
sextant altitude:		
temp:	10	C
pres:	1010	mb
parallax:	0	' (req'd for Moon/planet)
semi-diameter:	0	' (req'd for Moon/Sun)

Use The Online Nautical Almanac to fill in the data below based on the UTC time the sextant sight was taken.

Calc Ho | scroll dn

GHA: 225 37.5 hour 5
GHA: 240 40 next hour

Note: Use GHA Aries (listed next to planets) for stars.
GHA (star) = GHA(Aries) + SHA(star)

decl: 7 24.7 hour 5
decl: 7 24.7 next hour
◉ north (+) ○ south (-)

SHA: 270 52.7 (stars only)

DR lat: 29.424349
◉ north ○ south

DR long: 98.491142
○ east ◉ west

UTC Time | Calc Hc | scroll up

Calc Ho | scroll up

hh_part:	0.1825
GHA diff:	15.041666666666657
GHA real:	228.37010416666666
decl: diff:	WARNING: ZERO
decl real:	7.411666666666667
total gha:	139.24843750000002
lha:	40.757295500000026
raw lha:	40.757295500000026
sin(decl):	0.12899751971972556
cos(decl)*cos(LHA):	0.7511530376169985
hc:	0.8003950334061183

dip:	---
hs:	---
ic:	---
ha:	---
r:	---
hp:	---
pa:	---
sd:	---

Compare Hc degrees to Ho degrees. Convert degrees to nautical miles by multiplying by 60.

hc_deg:	**45.859257357403116**
x:	-0.36854658521923295
a:	1.9482413935508882
a_deg:	111.62600932315193
z:	**248.37399067684805**
LEFT	RIGHT

scroll up

ho_deg:	**---**
p:	undefined
nmi:	**undefined**
t/a:	**Away**
LEFT	RIGHT

Coast Guard Academy - Computed Greater Away

Computed sight reduction based on formulas from:
NAUTICAL ALMANAC 2021 COMMERCIAL EDITION,
pp 277-283
Paradise Cay Publications, Inc.
www.paracay.com
ISBN: 9781951116255

Helpful links:
2024 Nautical Almanac, UTC time, night sky over San Antonio, time zone map