Sight-Reduction Worksheet for Bygrave's Method

LoP = _____

Section 4 - "Sight Reduction"

AP: LatAP = ±_____°_____ (N/S)   GP: Dec = ±_____°_____ (N/S)   (0)

     LonAP = ±_____°_____ (E/W)   GHA = _____°_____

1.   LHA   = GHA + LonAP   = _____°_____ ± _____°_____ = _____°_____

    t   =   − LHA   = ±_____°_____   if(LHA < 180°)   (1)

    t   = 360°− LHA   = ±_____°_____   if(LHA > 180°)

2.   calculator: TAN Dec / COS t = shift TAN = _____ (LatQ)

    LatQ = ±_____

3.   dLat   = LatAP − LatQ   = ±_____ − ±_____ = ±_____   (3)

4.   Y   =   90° − dLat   =   90° − ±_____ = ±_____

5.   calculator: COS LatQ * TAN t / COS Y = shift TAN = _____ (Z)

    Z   = _____

6.   calculator: COS Z * TAN Y = shift TAN = _____ (Hc)

    Hc = _____

7.   Zc =   Z   = _____   (scheme 1)   (7)

    Zc =   180° + Z   = _____   (scheme 2)

    Zc =   180° − Z   = _____   (scheme 3)

    Zc =   360° − Z   = _____   (scheme 4)


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Remarks and Instructions
(0)  Use the appropriate signs for Latitude, Longitude and Declination: positive for N and E,
     negative for S and W.    For usage with an electronic calculator, angle values are used
     in decimal format instead of degree and minutes notation.

(1)  The meridian angle "t" is calculated from "LHA" according to the following rule:
     if LHA < 180°   t =       − LHA      (GP is WEST of AP)
     if LHA > 180°   t = 360° − LHA       (GP is EAST of AP)

(3)  The value of "dLat" must be calculated taking the correct signs for "LatAP" and "LatQ"
     into account. The resulting sign of "dLat" should be recorded correcly (see remark 0) and
     correctly used in step4 to calculate the complementary angle Y.

(7)  The true Azimuth "Zc" is obtained from "Z" according to one of the following cases:
     first select in which range the value of t is, then, depending on the sign of LatAP
     or dLat, select the correct calculations scheme for Zc:

     [-180°: -90°]  if LatAP is positive:  use  Zc = 360° − Z      (scheme 4)
                    if LatAP is negative:  use  Zc = 180° + Z      (scheme 2)

     [ -90°:   0°]  if dLat  is positive:  use  Zc = 180° + Z      (scheme 2)
                    if dLat  is negative:  use  Zc = 360° − Z      (scheme 4)

     [   0°: +90°]  if dLat  is positive:  use  Zc = 180° − Z      (scheme 3)
                    if dLat  is negative:  use  Zc =        Z      (scheme 1)

     [ +90°:+180°]  if dLat  is positive:  use  Zc =        Z      (scheme 1)
                    if dLat  is negative:  use  Zc = 180° − Z      (scheme 3)
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