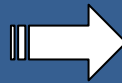


Geographic Coordinate System Conversions

Degrees° Minutes' Seconds''
(DMS)



Decimal Degrees
(DD)

$$(DMS)(24) = DD$$

$$(\text{Degrees}) + (\text{Minutes}/60) + (\text{Seconds}/3600) = DD$$

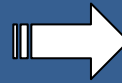
	A
1	30° 25' 48" N

OR

$$= (A1)*(24) = 30.43$$

$$= ((\text{MID}(A1,1,2)) + ((\text{MID}(A1,5,2))/60) + ((\text{MID}(A1,9,2))/3600)) = 30.43$$

Decimal Degrees
(DD)



Degrees° Minutes' Seconds''
(DMS)

$$(DD)/(24) = \text{DMS}$$

$$30.43 \text{ DD} \rightarrow 30^\circ 25' 48'' \text{ DMS}$$

	A
1	30.43

OR

$$30.43 \rightarrow (0.43*60) = 25.8 \rightarrow (0.8*60) = 48$$

$$= (A1)/(24) = 30^\circ 25' 48''$$

Degrees

Minutes

Seconds

Displaying the number in DMS formatting

- Right Click on the cell & go to **Format Cells**
- Select the **Custom** Category & type **[hh] mm' ss\''**
- To insert the decimal degree symbol position the cursor after the [hh] & hold down the **ALT** & type **0176**

Calculating the Distances Between 2 points

Great Circle Distances

DD

	Latitude	Longitude
Point 1	39.513	96.967
Point 2	39.200	94.967

$$= 6378.135 * \text{ACOS}(\text{COS}(\text{RADIANS}(90 - (\text{Lat}1\text{d}))) * \text{COS}(\text{RADIANS}(90 - (\text{Lat}2\text{d}))) + \text{SIN}(\text{RADIANS}(90 - (\text{Lat}1\text{d}))) * \text{SIN}(\text{RADIANS}(90 - (\text{Lat}2\text{d})))) * \text{COS}(\text{RADIANS}((\text{Long}1\text{d} - \text{Long}2\text{d})))$$

DMS

	Latitude	Longitude
Point 1	39° 30' 45"	96° 58' 00"
Point 2	39° 12' 00"	94° 58' 00"

$$= 6378.135 * \text{ACOS}(\text{COS}(\text{RADIANS}(90 - (\text{Lat}1 * 24))) * \text{COS}(\text{RADIANS}(90 - (\text{Lat}2 * 24))) + \text{SIN}(\text{RADIANS}(90 - (\text{Lat}1 * 24))) * \text{SIN}(\text{RADIANS}(90 - (\text{Lat}2 * 24)))) * \text{COS}(\text{RADIANS}(24 * (\text{Long}1 - \text{Long}2))))$$

Distance = 175.624 km (note: 6378.135 = the Earth's Radius in nautical km)

