

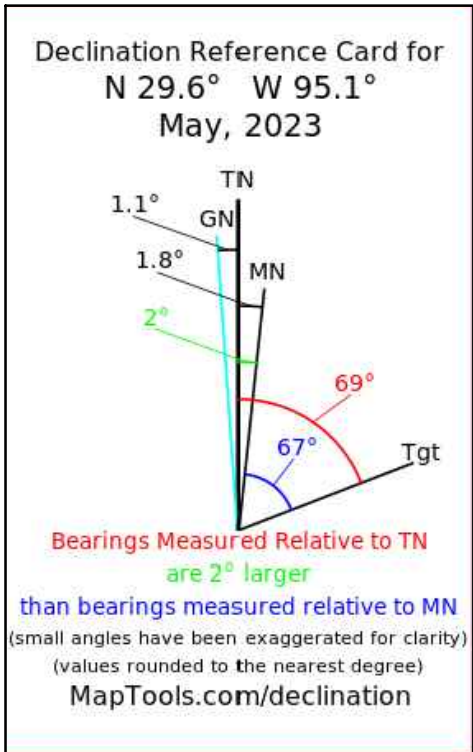




Line Table				
COURSE #	Direction	Length	AVG. STEPS	YOUR STEPS
C:1	43.0°	97'	42	
C:2	112.0°	48'	21	
C:3	40.0°	63'	27	
C:4	91.0°	61'	26	
C:5	9.0°	50'	22	
C:6	39.0°	70'	30	
C:7	93.0°	73'	32	
C:8	130.0°	80'	35	
C:9	118.5°	113'	49	
C:10	177.0°	88'	38	
C:11	170.0°	76'	33	
C:12	213.0°	72'	31	
C:13	238.0°	74'	32	
C:14	298.0°	67'	29	
C:15	259.0°	133'	58	
C:16	209.0°	57'	25	
C:17	250.0°	79'	34	
C:18	279.0°	43'	19	
C:19	223.0°	89'	39	
C:20	341.0°	216'	94	
C:21	1.0°	117'	51	
C:22	320.3°	681'	296	
C:23	224.1°	370'	161	
C:24	251.3°	268'	117	
C:25	280.7°	354'	154	
C:26	228.1°	336'	146	
C:27	165.3°	174'	76	
C:28	90.8°	571'	248	
C:29	62.1°	284'	123	
C:30	34.7°	517'	225	

COORDINATE TABLE				
Point #	Northing	Easting	LATITUDE	LONGITUDE
1	13,779,264.8'	3,209,268.3'	N029° 34' 49.21"	W095° 05' 43.81"
2	13,779,335.9'	3,209,334.7'	N029° 34' 49.90"	W095° 05' 43.03"
3	13,779,317.9'	3,209,379.4'	N029° 34' 49.70"	W095° 05' 42.53"
4	13,779,366.1'	3,209,419.8'	N029° 34' 50.17"	W095° 05' 42.05"
5	13,779,365.0'	3,209,481.2'	N029° 34' 50.14"	W095° 05' 41.36"
6	13,779,414.0'	3,209,489.0'	N029° 34' 50.62"	W095° 05' 41.25"
7	13,779,468.3'	3,209,532.9'	N029° 34' 51.14"	W095° 05' 40.73"
8	13,779,464.5'	3,209,606.0'	N029° 34' 51.08"	W095° 05' 39.91"
9	13,779,413.2'	3,209,667.2'	N029° 34' 50.55"	W095° 05' 39.24"
10	13,779,359.2'	3,209,766.5'	N029° 34' 49.98"	W095° 05' 38.13"
11	13,779,271.8'	3,209,771.0'	N029° 34' 49.12"	W095° 05' 38.11"
12	13,779,196.8'	3,209,784.3'	N029° 34' 48.37"	W095° 05' 37.99"
13	13,779,136.8'	3,209,745.3'	N029° 34' 47.79"	W095° 05' 38.46"
14	13,779,097.4'	3,209,682.2'	N029° 34' 47.42"	W095° 05' 39.18"
15	13,779,128.7'	3,209,623.3'	N029° 34' 47.75"	W095° 05' 39.84"
16	13,779,103.4'	3,209,493.0'	N029° 34' 47.54"	W095° 05' 41.32"
17	13,779,053.2'	3,209,465.2'	N029° 34' 47.06"	W095° 05' 41.66"
18	13,779,026.0'	3,209,390.4'	N029° 34' 46.81"	W095° 05' 42.51"
19	13,779,032.7'	3,209,347.8'	N029° 34' 46.89"	W095° 05' 43.00"
20	13,778,967.4'	3,209,286.8'	N029° 34' 46.27"	W095° 05' 43.71"
21	13,779,171.6'	3,209,216.5'	N029° 34' 48.31"	W095° 05' 44.43"
22	13,779,288.4'	3,209,218.5'	N029° 34' 49.46"	W095° 05' 44.36"
23	13,779,812.7'	3,208,783.8'	N029° 34' 54.80"	W095° 05' 49.08"
24	13,779,547.2'	3,208,526.7'	N029° 34' 52.26"	W095° 05' 52.10"
25	13,779,461.4'	3,208,272.6'	N029° 34' 51.49"	W095° 05' 55.00"
26	13,779,527.4'	3,207,924.5'	N029° 34' 52.26"	W095° 05' 58.92"
27	13,779,302.6'	3,207,674.1'	N029° 34' 50.12"	W095° 06' 01.84"
28	13,779,134.2'	3,207,718.3'	N029° 34' 48.44"	W095° 06' 01.40"
29	13,779,126.7'	3,208,289.7'	N029° 34' 48.17"	W095° 05' 54.94"
30	13,779,259.8'	3,208,540.8'	N029° 34' 49.41"	W095° 05' 52.04"
31	13,779,685.2'	3,208,834.9'	N029° 34' 53.52"	W095° 05' 48.55"

**DATUM REFERENCE**  
 GRS 80  
 NORTH AMERICAN DATUM 1983  
 TEXAS STATE COORDINATE SYSTEM SOUTH  
 CENTRAL ZONE - US SURVEY FEET  
 DIRECTION REFERENCE IN TABLE: GRID NORTH  
 MAGNETIC DECLINATION MAY 2023: 3°E  
<https://epsg.io/2278>  
<https://www.maptools.com/>



**BOY SCOUTS OF AMERICA  
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 UNIVERSITY OF HOUSTON - CLEAR LAKE CAMPUS  
 COMPASS ORIENTATION COURSE**

**SYDNEY CUNNINGHAM**

**SHEET 2 OF 3**

## A Brief Explanation of Magnetic Declination

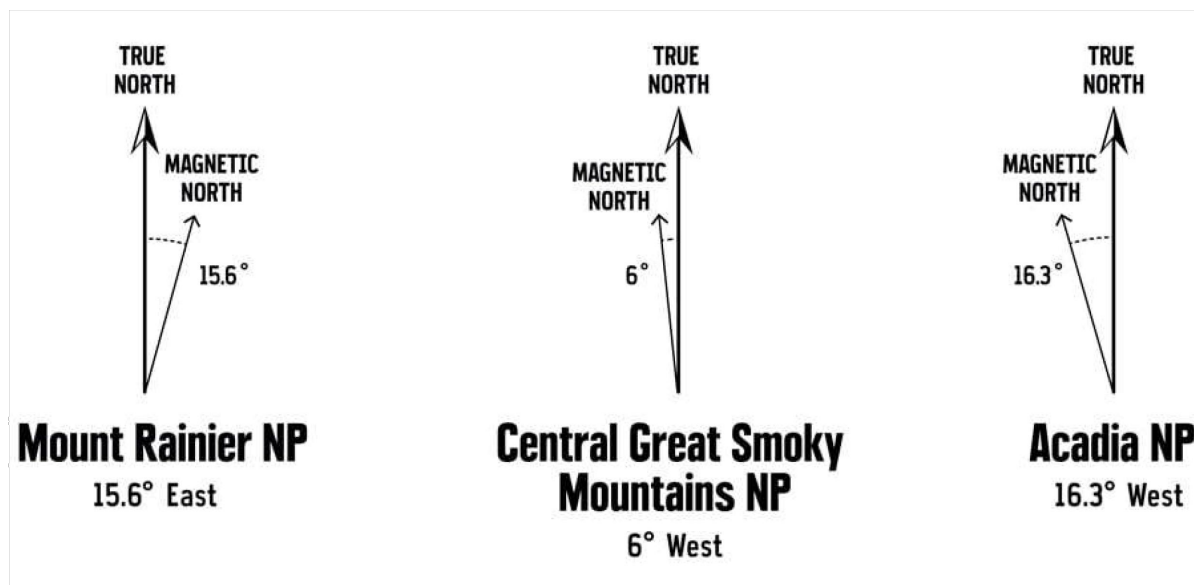
As a kid you learned that north is at the top of the globe. As a grown-up navigator, though, you now realize that the world isn't quite that simple. What we think of as the top of the globe is referred to as "true north." Magnetic north (where your compass needle actually points) is a function of Earth's magnetic fields and its core elements, which fluctuate in complicated ways. Currently, magnetic north is roughly north of Hudson Bay in Canada.

**The difference between magnetic north and true north is "magnetic declination."**

In the continental U.S., declination can vary from nearly 20 degrees east in places on the West Coast to nearly 20 degrees west in places on the East Coast. When you're navigating in the wilds, degrees matter. A 15 degree error, for example, on a mile-long hike puts you a quarter-mile away from your destination.

## Finding the Declination You Need to Set

Because declination varies depending on where you are on the globe, your first step is to find the declination value for your trip area. And whenever you head to a new area, you'll need to check, and likely reset, your compass declination for that area.



Topographic maps list declination in the legend, but an added complication is that declination in a given location also changes slowly over time. So check your map's revision date or, better yet, check the National Oceanic and Atmospheric Administration (NOAA) [website](http://www.ngdc.noaa.gov/geomag/calculators/magcalc.shtml#declination) for magnetic declination. The site should have the most up-to-date data.

[www.rei.com/learn/expert-advice/compass-declination.html](http://www.rei.com/learn/expert-advice/compass-declination.html)

[www.ngdc.noaa.gov/geomag/calculators/magcalc.shtml#declination](http://www.ngdc.noaa.gov/geomag/calculators/magcalc.shtml#declination)

## DETERMINING YOUR STEP LENGTH

TO DETERMINE YOUR EXACT STEP LENGTH GO TO COURSE 30 AND LOCATE THE ALUMINUM DISK AT EACH END. WALK NORMALLY IN A STRAIGHT LINE FROM ONE TO THE OTHER COUNTING AND THEN RECORDING YOUR STEPS. COURSE 31 IS 517 FEET LONG AND A PERSON WITH AN AVERAGE STRIDE WILL HAVE 224 STEPS, BUT IT CAN VARY GREATLY PERSON TO PERSON. TAKE THE STEPS IT TOOK YOU AND DIVIDE THAT NUMBER INTO 517 FEET. THE RESULT WILL BE YOUR NORMAL STEP DISTANCE IN FEET AND DIVIDING THAT NUMBER INTO EACH COURSE DISTANCE WILL GIVE YOU HOW MANY STEPS YOU WILL NEED TO GET FROM ONE POINT TO THE NEXT. AS A SHORT CUT YOU CAN DIVIDE THAT NUMBER INTO 100 AND THAT IS HOW MANY STEPS YOU NEED TO GO 100 FEET, EACH TIME YOU REACH THAT NUMBER YOU START AGAIN FROM ONE BUT DON'T LOOSE COUNT OF HOW MANY TIMES YOU HAVE STARTED OVER. PLACING AN OBJECT (SMALL ROCK, TWIG ETC.) IN YOUR HAND AT EACH 100 FEET CAN HELP KEEP COUNT.

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**SHEET 3 OF 3**