

Magnetic vs True - Ground Lesson

Attention

Are runway numbers magnetic or true?

Objective

To know the difference between Magnetic North and True North. To know how to calculate between magnetic and true.

Schedule

Ground instruction – 15 minutes

Reference Material

Gleim

https://en.wikipedia.org/wiki/True_north

Material

True north (geodetic north) is the direction along the earth's surface towards the geographic North Pole. True geodetic north differs from magnetic north (the direction a compass points toward the magnetic north pole), and from grid north (the direction northwards along the grid lines of a map projection).

On maps published by the United States Geological Survey and the United States Armed Forces, true north is marked with a line terminating in a five-pointed star. The east and west edges of the USGS topographic quadrangle maps of the United States are meridians of longitude, thus indicating true north (so they are not exactly parallel). Maps issued by the United Kingdom Ordnance Survey contain a diagram showing the difference between true north, grid north, and magnetic north at a point on the sheet; the edges of the map are likely to follow grid directions rather than true, and the map will thus be truly rectangular/square.

Using magnetic north

MH – Magnetic Heading

MC – Magnetic Course

Using true north

TH – True Heading

TC – True Course

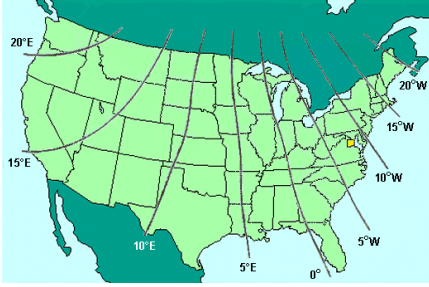
$TH = TC - WCA$ (wind correction angle)

$MH = TH \pm \text{variation}$

+ West / - East

'east is least'

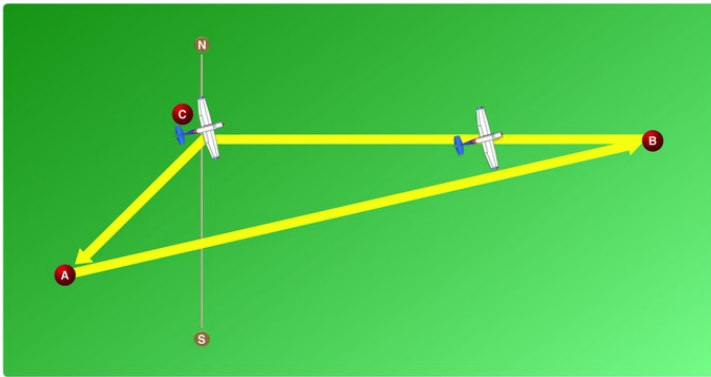
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Variation depends on location

Variation is due to true north and magnetic north in different locations

Deviation is due to how the plane is built and is different for different headings



The line connecting Point A to Point B represents the true heading and airspeed line.

The line connecting Point C to Point A represents the wind direction and velocity line.

The line connecting Point C to Point B represents the true course and groundspeed line.

$$TC \pm WCA = TH$$

If you read it, it's True
METARs, TAFs

If you hear it, it's Magnetic
ATIS/AWOS/ASOS