Converting Between Decimal form and DMS Form

This example is taken from page 414 in your textbook.

Minutes and Seconds

Fractional parts of a degree are usually expressed in decimal form or in *minutes* and *seconds*. A **minute** (') is $\frac{1}{60}$ of a degree, and a **second** ('') is $\frac{1}{3600}$ of a degree. This form is often called **DMS Form**, for degrees, minutes, and seconds.

Example:

(a) Write $35°\ 15'\ 27''$ in decimal form.

$$35°\ 15'\ 27'' = 35° + \left(\frac{15}{60}\right)° + \left(\frac{27}{3600}\right)°$$

$$= 35° + 0.25° + 0.0075°$$

$$= 35.2575°$$

(b) Write $48.3625°$ in DMS form.

First, convert the entire decimal part to minutes by writing it in terms of $\frac{1}{60}$ of a degree.

$$48.3625° = 48° + 0.3625° = 48° + \left(\frac{60}{60}\right)0.3625°$$

$$= 48° + \left(\frac{21.75}{60}\right)° = 48° + 21.75'$$

Second, convert the decimal part of the mins to seconds by writing it in terms of $\frac{1}{60}$ of a minute.

$$48° + 21.75' = 48° + 21' + \left(\frac{60}{60}\right)0.75'$$

$$= 48° + 21' + \left(\frac{45}{60}\right)'$$

$$= 48°\ 21'\ 45''$$

Convert the following two angles:
1. $87°\ 15'\ 36''$
2. $-17.6243°$

Homework (Title: Right-Triangle Trigonometry)
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