Due: April 27, 2010

Date:_____ Period:_____

There are several ways to measure the size of an angle. Two ways we have
already studied are to use units of degrees and radian measure.

In a complete circle there are 360degrees. An angle could have a measurement of
35.75 degrees. That is, the size of the angle in this case would be thirty-five full degrees plus
seventy-five hundredths, or three fourths, of an additional degree. Notice that here we are
expressing the measurement as a decimal number. Using decimal numbers like this one can
express angles to any precision - to hundredths of a degree, to thousandths of a degree, and
so on.

There is another way to state the size of an angle. The degree is divided into sixty parts called minutes. These minutes
are further divided into sixty parts called seconds. The words minute and second used in this context have no
immediate connection to how those words are usually used as amounts of time.

In a full circle there are 360 degrees.
Each degree is split up into 60 parts, 1° = 60'
Each minute is split up into 60 parts, 1' = 60"
Therefore, each degree = 360" (1° = 60'x 60")
Symbol for degree: ○   Symbol for minute: '   Symbol for second: "

→ The size of an angle could be stated this way: 40 degrees, 20 minutes, 50 seconds.

usually written in DMS(degree, minute, second) form : $40° \, 20' \, 50''$

→ The above DMS form of an angle can be expressed in decimal notation → DD(decimal degree)

40 + (20 /60) + (50 /3600) = 40.34722……

That is, we have 40 full degrees, 20 minutes out of total 60 minutes of a degree, and 50 seconds out of 3600 seconds of
a degree.   So, 40°20'50" ≈ 40.3

Suppose we start with **40.3472 degrees**. Can we express that in units of degrees, minutes, and seconds?

There are definitely **40 degrees** full degrees. That leaves a left over of **0.3472 degrees**.
So, how many minutes is 0.3472 degrees?

Well, how many times can 1/60 go into 0.3472? Here's the same question: What is 60 times 0.3472?

It's 20.832. So, there are **20 complete minutes** with **0.832 of a minute** remaining.

How many seconds are in the last 0.832 minutes. Well, how many times can 1/60 go into 0.832, or what is 60 times
0.832? It's **49.92, or almost 50 seconds**.

So, we've figured that **40.3472 degrees is almost exactly equal to 40 degrees, 20 minutes, 50 seconds**.

▶Degree practice 1: Convert these DMS to the DD form.

Round off to four decimal places!

(1) 89° 11' 15"

(2) 12° 15' 0"

(3) 33° 30'

(4) 71° 0' 30"

(5) 42° 24' 53"

(6) 38° 42' 25"

(7) 29° 30' 30"

(8) 0° 49' 49"

(9) 10° 40' 3"

(10) 55° 33' 44"

▶Degree practice 1: Convert these DD to the DMS form.

Round off the seconds if there is a left over!

(1) 75.25°

(2) 43.375°

(3) 9.5625°

(4) 33.9645°

(5) 13.12345°

(6) 21.5°

(7) 59.7892°

(8) 65.1836°

(9) 12.3456°

(10) 0.50417°