DMS = Degrees, Minutes, Seconds

$1^\circ = 60' = 3600''$, $^\circ$ = degree, $'$ = minute, $''$ = seconds

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Convert between degrees and DMS, and round to the second.

1) 179.999

$= 179^\circ + 0.999^\circ \left(\frac{60'}{1^\circ}\right)$ convert to minutes

$= 179^\circ + 59.94'$

$= 179^\circ + 59' + 0.94' \left(\frac{60''}{1'}\right)$ converte to seconds

$= 179^\circ + 59' + 56.4''$

$= 179^\circ\ 59'\ 56''$

round the second, round(56.4) = 56

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2) $-32^\circ\ 10'\ 12''$, convert from DMS to degrees

$= -(32^\circ\ 10'\ 12'' \left(\frac{1'}{60''}\right)$ | convert seconds to minutes

$= -(32^\circ\ 10.2'$

$= -(32^\circ\ 10.2' \left(\frac{1^\circ}{60'}\right)$

$= -(32^\circ + 0.17^\circ)$

$= 32.17^\circ$

Quiz

Q1- What is the measure, in DMS of 38.27°?

Sol.:

$-38° + 0.27°\left(\frac{60'}{1°}\right)$

$-38° 16' + 0.2'\left(\frac{60''}{1'}\right)$

$-38° 16' 12''$

Q2- If the measure of an angle in DMS is 55° 36' 18", what is its measure in decimal degrees?

$-55° 36' 18''\left(\frac{1'}{60''}\right)$

$-55° 36.3'$

$-55° 36.3\left(\frac{1°}{60'}\right)$

$= 55.605°$

Q3)- if a disc rotates 190° 41' 59" about its center, followed immediately by a rotation of 135° 56' 37" about its center, what is the total angle that the disc rotates?

Sol.:

- Convert the angles from DMS to degrees.

$190°41'58''\left(\frac{1'}{60''}\right)$

$= 190°41.96'\left(\frac{1°}{60'}\right)$

$= 190.69°$

$190.69°$

$135°56'37''\left(\frac{1'}{60''}\right)$

$135°56.61'\left(\frac{1°}{60'}\right)$

$135.94°$

$135.94°$

$326.63° \Longrightarrow$ DMS

$326° + 0.63°\left(\frac{60'}{1°}\right)$

$326°37' + 0.8'\left(\frac{60''}{1'}\right)$

$326°37'48''$

$326°37'48''$