

Angles & Polar Worksheet

Current Unit	Convert To	Rectangular Coordinates	
DEG	DEG	X 4.00	Y 3.00
RAD	RAD	Polar Coordinates	
GRD	GRD	Radius (R) 5.00	Angle (Ø) 36.87
DMS	DMS		
Δ%	Δ%	π	$\pi/2$ $\pi/3$ $\pi/4$ $\pi/5$

This worksheet adds functions to perform conversions of Angles units and Polar-Rectangular coordinates.

Angles & Polar Actions	
Current Unit [DEG], [RAD], [GRD], [DMS] or [Δ%]	Set the current angular unit (Decimal degrees, radians, gradians, degree-minute-seconds or slope percent)
Convert To [DEG], [RAD], [GRD], [DMS] or [Δ%]	Convert the displayed number from the ‘Current Unit’ to Degrees, Radians, Gradians, Degree-Minutes-Seconds or Slope percent. Also updates the ‘Current Unit’ accordingly.
[X]	Stores or calculates the ‘X’ rectangular coordinate.
[Y]	Stores or calculates the ‘Y’ rectangular coordinate.
[R]	Stores or calculates the radius ‘R’ polar coordinate.
[Ø]	Stores or calculates the angle ‘Ø’ polar coordinate in the selected “Current Unit”.
[π], [$\pi/2$], [$\pi/3$], [$\pi/4$] or [$\pi/5$]	Shortcuts to enter the value of pi and selected fractions into the calculator.

The calculation of the Polar-Rectangular conversion are performed accordingly to the selected “Current Unit” (**DEG, RAD, GRD, DMS** or **Δ%**).

If any other key is pressed before one of the **Blue** keys, the displayed number is stored in the corresponding variable. Otherwise, the variable is calculated.

Example 1: Convert the rectangular coordinate (10.0, 5.0) to polar coordinates. Express the angular result in Degrees.

Keystrokes	Description
Select [DEG]	Set the current angle unit to Degrees.
10 [X]	Input the X-coordinate.
5 [Y]	Input the Y-coordinate.
[R]	Calculate the radius. R = 11.1803 (Radius)
[∅]	Calculate the angle. ∅ = 26.5651 (Degrees)

Example 2: Convert the polar coordinate (12.0 , $\angle 30.0^\circ$) to rectangular coordinates.

Keystrokes	Description
Select [DEG]	Set the current angle unit to Degrees.
12 [R]	Input the Radius polar coordinate.
30 [∅]	Input the Angle polar coordinate.
[X]	Calculate the X-coordinate. X = 10.3923
[Y]	Calculate the Y-coordinate. Y = 6.0000

Example 3: Convert $88^\circ 57' 23.45''$ to decimal degrees.

Keystrokes	Description
88.572345	Type the angle value
Select [DMS]	Set the current angle unit to Degree-Minute-Seconds.
Convert To [DEG]	Convert to decimal Degrees. Result = 88.9565

Example 4: Convert " $\pi / 3$ " Radians to Degree-Minute-Second Format.

Keystrokes	Description
[$\pi / 3$]	Input initial value. Result = 1.0472 ($\pi / 3$ radians).
Select [RAD]	Set the current angle unit to Radians.
Convert To [DMS]	Convert to D.MMSS format. Result = 60.00 ($60^\circ 0' 0''$).

Example 5: Convert 23.5 Degrees to radians, gradians, slope percent and Degree-Minutes-Seconds.

Keystrokes	Description
23.5	Type the initial value
Select [DEG]	Set the current angle unit to Degrees.
Convert To [RAD]	Convert to Radians. Result = 0.4102
Convert To [GRD]	Convert to Gradians. Result = 26.1111
Convert To [Δ%]	Convert to slope percent. Result = 43.4812
Convert To [DMS]	Convert to D.MMSS format. Result = 23.3000 (23° 30' 0").