Angle Conversion Chart

Degrees, radians, gradians, arcminutes and arcseconds, plus slope and roof pitch

For: Students, surveyors, roofers, engineers and programmers

allunitconversions.com/angle-conversion-chart
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EXACT DEFINITION	FORMULA	REVERSE	WORKED EXAMPLE
360° = 2π rad = 400 gon; 1° = 60′ = 3600″	rad = ° × π ÷ 180; slope % = tan(°) × 100	° = rad × 180 ÷ π; ° = arctan(slope % ÷ 100)	A 6/12 roof pitch = 26.57° = 50 % slope

Matrix values use 6 significant figures; slope angles to 2 decimal places.

Factor matrix — 1 unit in every other unit

1 unit =	°	rad	gon	′	″
1 °	1	0.0174533	1.11111	60	3,600
1 rad	57.2958	1	63.662	3,437.75	206,265
1 gon	0.9	0.015708	1	54	3,240
1 ′	0.0166667	2.90888×10^{-4}	0.0185185	1	60
1 ″	2.77778×10^{-4}	4.84814×10^{-6}	3.08642×10^{-4}	0.0166667	1

Common angles

Degrees (°)	Radians (exact)	Radians (rad)	Gradians (gon)
0	0	0.00000	0
15	π/12	0.26180	16.667
30	π/6	0.52360	33.333
45	π/4	0.78540	50
60	π/3	1.04720	66.667
90	π/2	1.57080	100
120	2π/3	2.09440	133.333
135	3π/4	2.35619	150
150	5π/6	2.61799	166.667

Degrees (°)	Radians (exact)	Radians (rad)	Gradians (gon)
180	π	3.14159	200
210	7π/6	3.66519	233.333
225	5π/4	3.92699	250
240	4π/3	4.18879	266.667
270	3π/2	4.71239	300
300	5π/3	5.23599	333.333
315	7π/4	5.49779	350
330	11π/6	5.75959	366.667
360	2π	6.28319	400

Slope percentage to angle (ramps, roads, drainage)

Slope % = rise ÷ run × 100. 8.33 % is a 1:12 wheelchair ramp.

Slope (%)	Angle (°)	Ratio (1 in …)
1	0.57	100.0
2	1.15	50.0
2.5	1.43	40.0
4	2.29	25.0
5	2.86	20.0
6	3.43	16.7
8	4.57	12.5
8.33	4.76	12.0
10	5.71	10.0
12	6.84	8.3

Slope (%)	Angle (°)	Ratio (1 in …)
15	8.53	6.7
20	11.31	5.0
25	14.04	4.0
30	16.70	3.3
33.3	18.42	3.0
40	21.80	2.5
50	26.57	2.0
60	30.96	1.7
75	36.87	1.3
100	45.00	1.0

Roof pitch (rise per 12 run) to angle

Pitch is the rise for every 12 units of run (6 = 6/12 pitch).

Pitch	Angle (°)	Slope (%)	Pitch	Angle (°)	Slope (%)	Pitch	Angle (°)	Slope (%)
1	4.76	8.3	**9**	36.87	75.0	**17**	54.78	141.7
2	9.46	16.7	**10**	39.81	83.3	**18**	56.31	150.0
3	14.04	25.0	**11**	42.51	91.7	**19**	57.72	158.3
4	18.43	33.3	**12**	45.00	100.0	**20**	59.04	166.7
5	22.62	41.7	**13**	47.29	108.3	**21**	60.26	175.0
6	26.57	50.0	**14**	49.40	116.7	**22**	61.39	183.3
7	30.26	58.3	**15**	51.34	125.0	**23**	62.45	191.7
8	33.69	66.7	**16**	53.13	133.3	**24**	63.43	200.0

Sources and method

- **BIPM SI Brochure, 9th edition** — Definitions of the SI units, including the kelvin (www.bipm.org/en/publications/si-brochure)
- **NIST Special Publication 811** — Guide for the Use of the International System of Units (www.nist.gov/pml/special-publication-811)

Conversion values on this sheet are generated by the AllUnitConversions conversion library and automatically checked against the exact definitions above before the PDF is produced; reference tables are taken from the sources listed. Interactive version, corrections and more charts: **allunitconversions.com/angle-conversion-chart**