Unit Circle Values to Remember

27 cards

Scan to add to the app

TERM	DEFINITION
0°	0 radians; (cos, sin) = (1, 0) The start: the point on the positive x-axis.
30°	π/6 radians; (cos, sin) = (√3/2, 1/2) Short height: sin 30° = 1/2, the smallest nonzero sine among the first-quadrant special angles.
45°	π/4 radians; (cos, sin) = (√2/2, √2/2) The only first-quadrant angle where cos = sin.
60°	π/3 radians; (cos, sin) = (1/2, √3/2) Mirror of 30° across the line y = x: cosine and sine swap.
90°	π/2 radians; (cos, sin) = (0, 1) Straight up: cos 90° = 0, sin 90° = 1.
120°	2π/3 radians; (cos, sin) = (−1/2, √3/2) Mirror of 60° across the y-axis: only cosine changes sign.
135°	3π/4 radians; (cos, sin) = (−√2/2, √2/2) Mirror of 45° across the y-axis.
150°	5π/6 radians; (cos, sin) = (−√3/2, 1/2) Mirror of 30° across the y-axis.
180°	π radians; (cos, sin) = (−1, 0) Half a turn: the point on the negative x-axis.
210°	7π/6 radians; (cos, sin) = (−√3/2, −1/2) 180° + 30°: the point opposite 30°, both signs flipped.

TERM	DEFINITION
225°	5π/4 radians; (cos, sin) = (−√2/2, −√2/2) 180° + 45°: the point opposite 45°.
240°	4π/3 radians; (cos, sin) = (−1/2, −√3/2) 180° + 60°: the point opposite 60°.
270°	3π/2 radians; (cos, sin) = (0, −1) Straight down: cos 270° = 0, sin 270° = −1.
300°	5π/3 radians; (cos, sin) = (1/2, −√3/2) Mirror of 60° across the x-axis: only sine changes sign.
315°	7π/4 radians; (cos, sin) = (√2/2, −√2/2) Mirror of 45° across the x-axis.
330°	11π/6 radians; (cos, sin) = (√3/2, −1/2) Mirror of 30° across the x-axis.
360°	2π radians; (cos, sin) = (1, 0) A full turn lands back on the point for 0°.
Coordinates of the point at angle θ on the unit circle	(cos θ, sin θ) x is the cosine and y is the sine, because the radius is 1.
Tangent of θ on the unit circle	tan θ = sin θ / cos θ = y / x, where cos θ ≠ 0 It is the slope of the terminal ray: tan 45° = 1, undefined at 90° and 270°.
Sine of 0°, 30°, 45°, 60°, 90° as one pattern	√0/2, √1/2, √2/2, √3/2, √4/2 Simplified: 0, 1/2, √2/2, √3/2, 1. Sine grows as the angle grows.
Cosine of 0°, 30°, 45°, 60°, 90° as one pattern	√4/2, √3/2, √2/2, √1/2, √0/2 The sine list read backward: cosine shrinks from 1 to 0.

TERM	DEFINITION
Conversion from degrees to radians	Multiply by π/180 Example: 60° × π/180 = π/3. To go the other way, multiply by 180/π.
Reference angle of 150°	30° The acute angle to the x-axis (180° − 150°). Same values as 30°, with the signs of Quadrant II.
Signs of cosine and sine in Quadrant II	Cosine negative, sine positive x < 0 and y > 0, as at 120°, 135°, 150°.
Signs of cosine and sine in Quadrant III	Both negative x < 0 and y < 0, as at 210°, 225°, 240°.
Signs of cosine and sine in Quadrant IV	Cosine positive, sine negative x > 0 and y < 0, as at 300°, 315°, 330°.
ASTC rule for the signs by quadrant	I: All positive; II: Sine; III: Tangent; IV: Cosine Only the named function (and its reciprocal) is positive. OpenStax says “A Smart Trig Class”.