

Converting between degrees and radians

To convert between degrees and radians, we just need to remember that

$$360^\circ = 2\pi$$

We could also divide both sides of this by 2 to get

$$180^\circ = \pi$$

This $180^\circ = \pi$ is the formula we'll use to convert between degrees and radians.

If we need to convert an angle from degrees to radians, we'll multiply it by $\pi/180^\circ$ in order to cancel the degrees and be left with just radian units. On the other hand, if we want to convert an angle from radians to degrees, we'll multiply it by $180^\circ/\pi$ in order to cancel the radians and be left with just degree units.

Example

Convert 68° to radians.

Since we're converting from degrees to radians, we'll multiply by $\pi/180^\circ$.

$$68^\circ = 68^\circ \left(\frac{\pi}{180^\circ} \right)$$

$$68^\circ = \frac{68}{180}\pi$$



$$68^\circ = \frac{17}{45}\pi$$

So 68° is equivalent to $(17/45)\pi$ radians.

If you have an angle that's given in radians and you want to convert it to degrees, you'll multiply it by $180^\circ/\pi$.

Example

Convert $(4/5)\pi$ to degrees.

Since we're converting from radians to degrees, we'll multiply by $180^\circ/\pi$.

$$\frac{4}{5}\pi = \frac{4}{5}\pi \left(\frac{180^\circ}{\pi} \right)$$

$$\frac{4}{5}\pi = \frac{4(180^\circ)}{5}$$

$$\frac{4}{5}\pi = \frac{720^\circ}{5}$$

$$\frac{4}{5}\pi = 144^\circ$$

Below is a table of some of the most common angles that shows the conversion between degrees and radians.



Degrees	Radians	Location
0	0	Positive horizontal axis
30	$\pi/6$	1st quadrant
45	$\pi/4$	1st quadrant
60	$\pi/3$	1st quadrant
90	$\pi/2$	Positive vertical axis
120	$2\pi/3$	2nd quadrant
135	$3\pi/4$	2nd quadrant
150	$5\pi/6$	2nd quadrant
180	π	Negative horizontal axis
210	$7\pi/6$	3rd quadrant
225	$5\pi/4$	3rd quadrant
240	$4\pi/3$	3rd quadrant
270	$3\pi/2$	Negative vertical axis
300	$5\pi/3$	4th quadrant
315	$7\pi/4$	4th quadrant
330	$11\pi/6$	4th quadrant
360	2π	Positive horizontal axis



