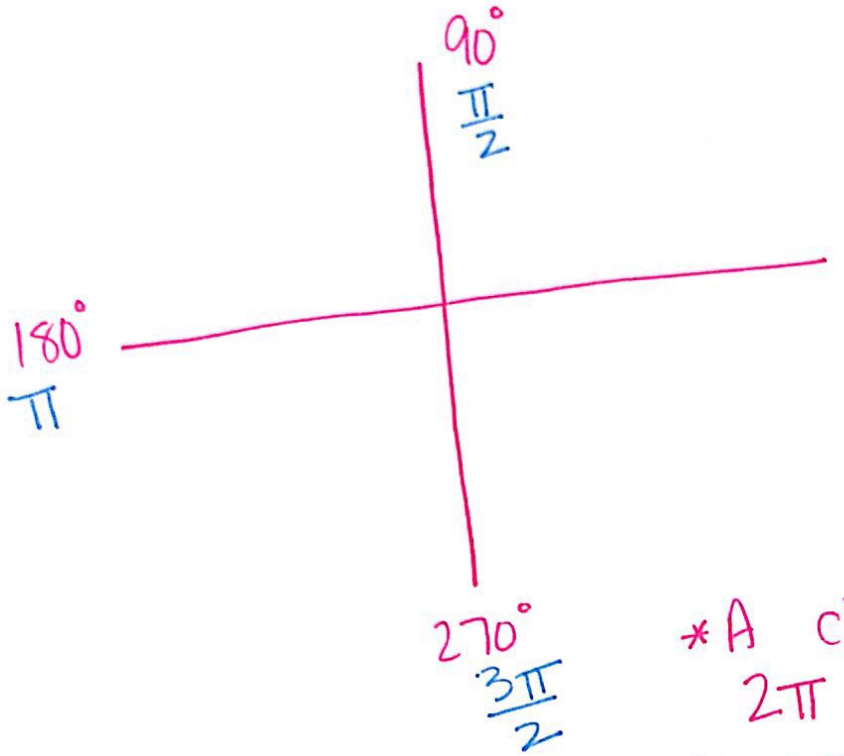
7.3: Relationship Between Degrees & Radians



$C = 2\pi r$

unit circle has a radius of 1

$C = 2 \cdot \pi \cdot 1$

$C = 2\pi$

* A circle is 360° or 2π radians
* conversion factor: $180° = \pi$ radians

- Convert degrees to radians:

Ex 1) $120°$ $\quad \frac{120°}{1} \cdot \left(\frac{\pi}{180°}\right) = \frac{120\pi}{180} = \boxed{\frac{2\pi}{3}}$

$\times$

Ex 2) $-545°$ $\quad \frac{-545°}{1} \cdot \left(\frac{\pi}{180°}\right) = \frac{-545\pi}{180} = \boxed{\frac{-109\pi}{36}}$

D → R

• convert radians to degrees

Ex 3) $\frac{2\pi}{9}$ $\frac{2\pi}{9} \cdot \left(\frac{180^\circ}{\pi}\right) = \frac{360^\circ}{9} = \boxed{40^\circ}$

Ex 4) $\frac{11\pi}{7}$ $\frac{11\pi}{7} \cdot \left(\frac{180^\circ}{\pi}\right) = \frac{1980^\circ}{7} = \boxed{282.86^\circ}$

R → D

• Sketch Radian Angles in standard position

Ex 5) Sketch $\frac{\pi}{3}$ $\frac{\pi}{3}\left(\frac{180^\circ}{\pi}\right) = \frac{180^\circ}{3} = 60^\circ$