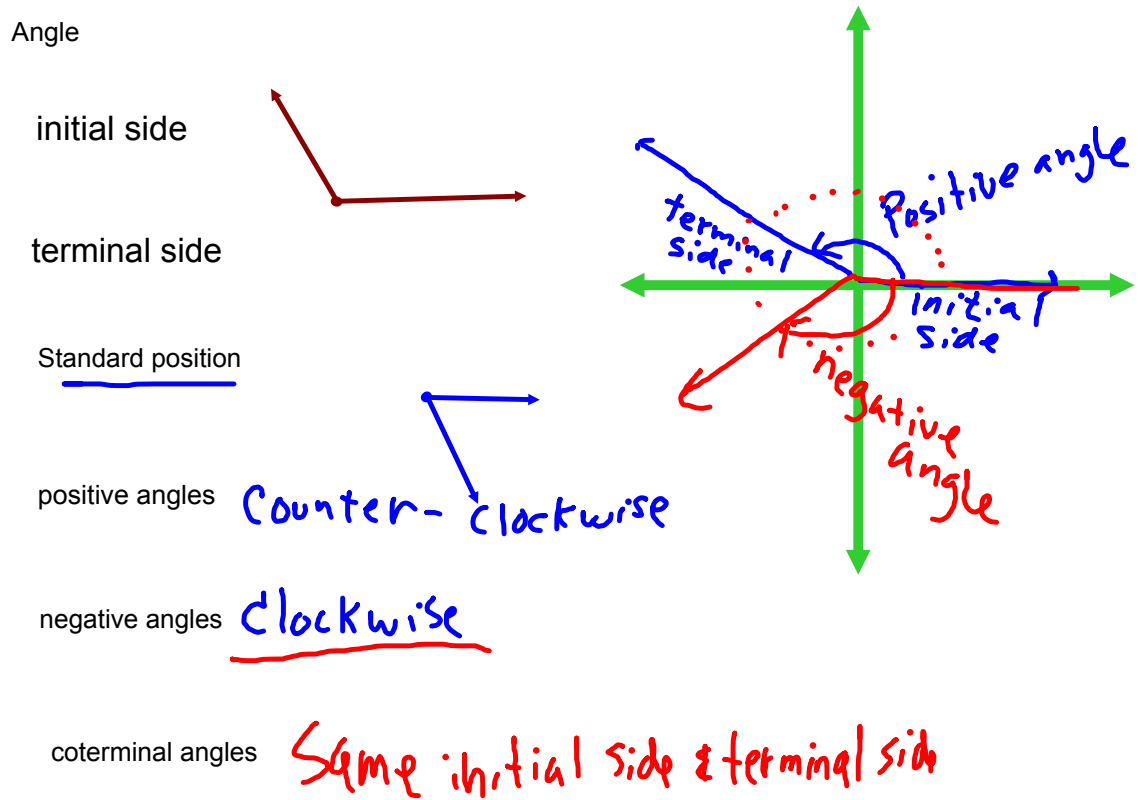


Trig 1.1 ~ Angles in Degrees and Radians

You will learn to:

- Describe angles using proper vocabulary.
- Convert between degree and radian measure.

Angles in degrees and radians

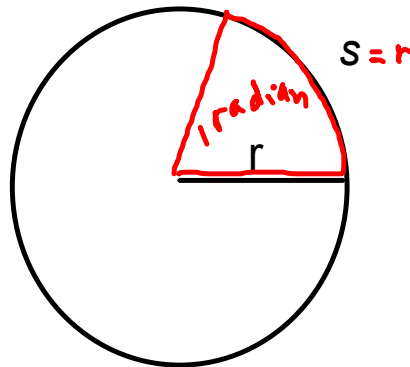


Radian measure of an angle

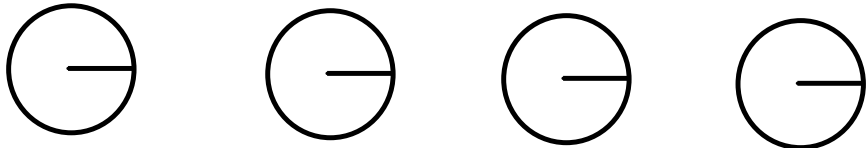
A radian is the angle, θ that intercepts an arc, S , equal in length to r , the radius of the circle.

$$\theta = \frac{S}{r} \quad \frac{\text{arc length}}{\text{radius}}$$

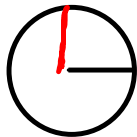
$$\underline{S} = \underline{r} \underline{\theta} \quad \text{radians.}$$



Common angles:



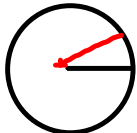
Right angle



$$C = 2\pi r \quad r=1$$

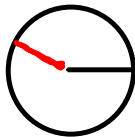
$$90^\circ = \frac{1}{4}(2\pi r) = \frac{\pi}{2}r = \frac{\pi}{2}$$

Acute angle



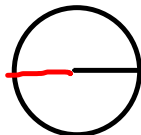
$$0^\circ \leq \theta \leq 90^\circ \quad (0, \frac{\pi}{2})$$

Obtuse angle



$$90^\circ \leq \theta \leq 180^\circ \quad (\frac{\pi}{2}, \pi)$$

Straight angle



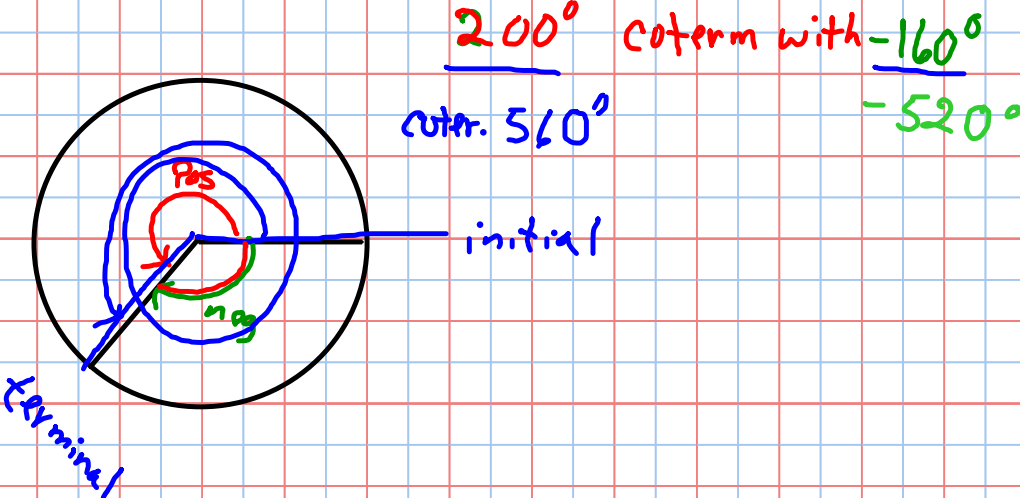
$$180^\circ = \pi \text{ rad}$$

Angles $> \pi$?



$$\theta > 180^\circ \quad \theta > \pi \text{ rad}$$

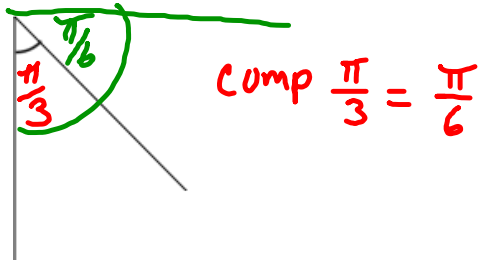
Coterminal angles: Have the same terminal side.



Complementary angles

$$\text{sum} = \frac{\pi}{2}$$

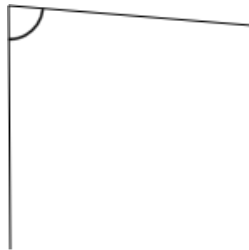
(90°)



Supplementary angles

$$\text{sum} = \pi$$

(180°)



CONVERTING FROM DEGREES TO
RADIANS
OR
FROM RADIANS TO DEGREES

360° = 2π radians

180° = π

$\frac{180^\circ}{\pi} = 1$
 $\frac{\pi}{180^\circ} = 1$

Convert to radians: $\frac{8^2}{72^\circ} \cdot \frac{\pi}{180^\circ} = \frac{2\pi}{5}$

$\frac{-148^\circ}{45} \cdot \frac{\pi \text{ rad.}}{180^\circ} = -\frac{37\pi}{45} \text{ rad.}$

convert to degrees: $\frac{3\pi}{12} \cdot \frac{180^\circ}{\pi} = 45^\circ$

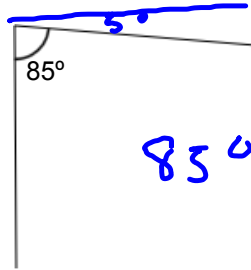
$\frac{5\pi}{3} \cdot \frac{180^\circ}{\pi} = 300^\circ$

**Radians are a pure number, so if you see no unit of measure, radians are implied.

Return to complementary and supplementary angles

Complementary angles

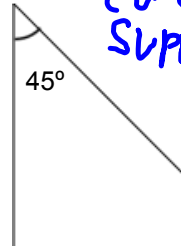
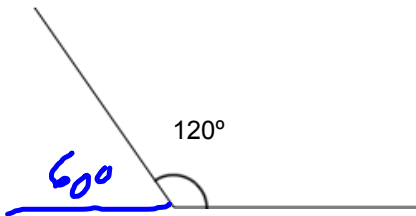
sum = 90°



85° comp 5°

Supplementary angles

sum = 180°



comp $45^\circ = 45^\circ$
SUPP $45^\circ = 135^\circ$

Supp
pairs

