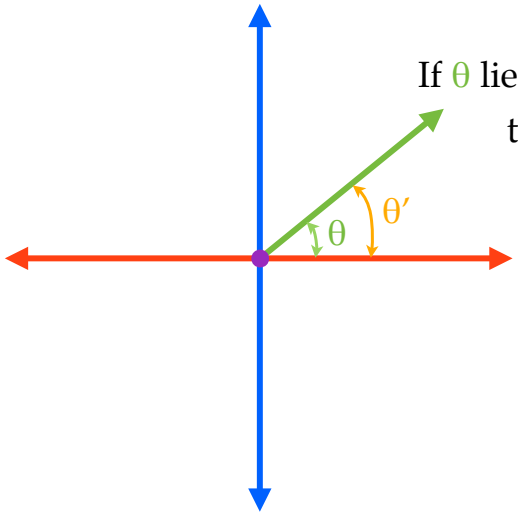
Reference Angles

Name _____

Date _____ Period _____

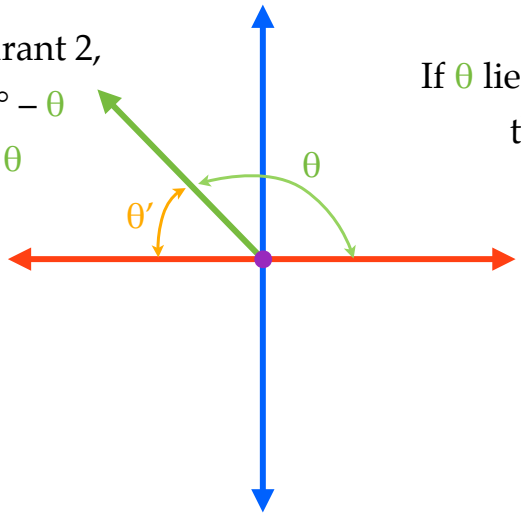
Given θ is in standard position, the reference angle of θ, noted θ′, is the acute angle formed by the terminal side of θ and the horizontal x-axis.



If θ lies in quadrant 1,
then θ′ = θ

Given θ is in standard position, the reference angle of θ, noted θ′, is the acute angle formed by the terminal side of θ and the horizontal x-axis.

If θ lies in quadrant 2,
then θ′ = 180° – θ
or θ′ = π – θ

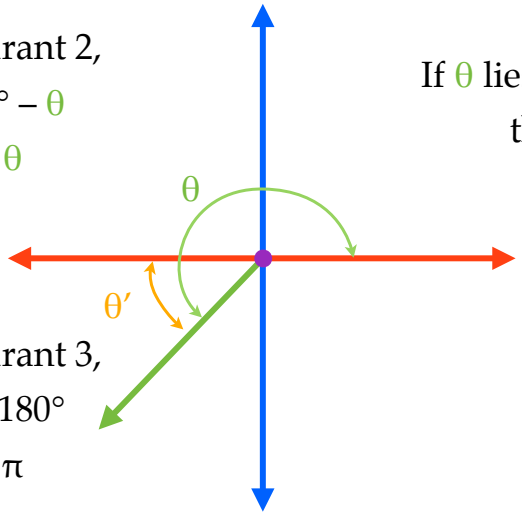


If θ lies in quadrant 1,
then θ′ = θ

Given θ is in standard position, the reference angle of θ, noted θ′, is the acute angle formed by the terminal side of θ and the horizontal *x*-axis.

If θ lies in quadrant 2,
then $\theta' = 180° - \theta$
or $\theta' = \pi - \theta$

If θ lies in quadrant 1,
then $\theta' = \theta$

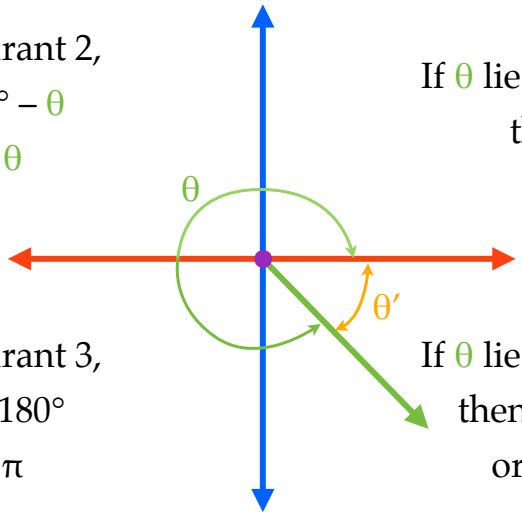


If θ lies in quadrant 3,
then $\theta' = \theta - 180°$
or $\theta' = \theta - \pi$

Given θ is in standard position, the reference angle of θ, noted θ′, is the acute angle formed by the terminal side of θ and the horizontal *x*-axis.

If θ lies in quadrant 2,
then $\theta' = 180° - \theta$
or $\theta' = \pi - \theta$

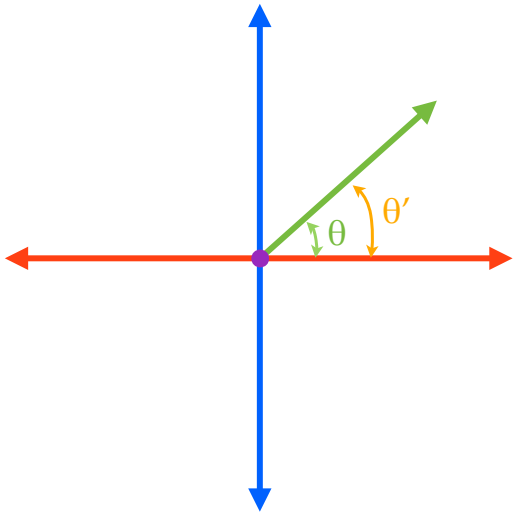
If θ lies in quadrant 1,
then $\theta' = \theta$



If θ lies in quadrant 3,
then $\theta' = \theta - 180°$
or $\theta' = \theta - \pi$

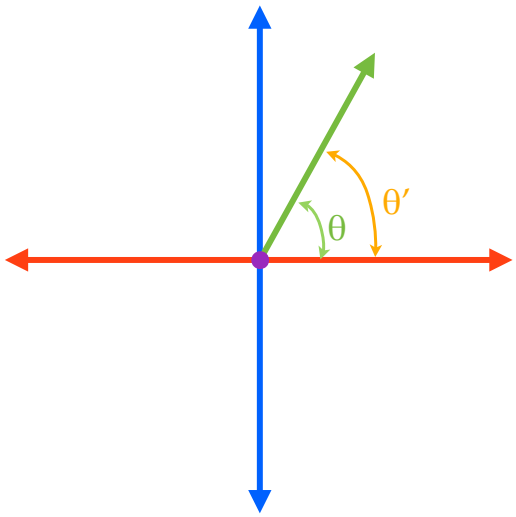
If θ lies in quadrant 4,
then $\theta' = 360° - \theta$
or $\theta' = 2\pi - \theta$

Given θ is in standard position, the reference angle of θ, noted θ′, is the acute angle formed by the terminal side of θ and the horizontal x-axis.



Given $\theta = 45°$

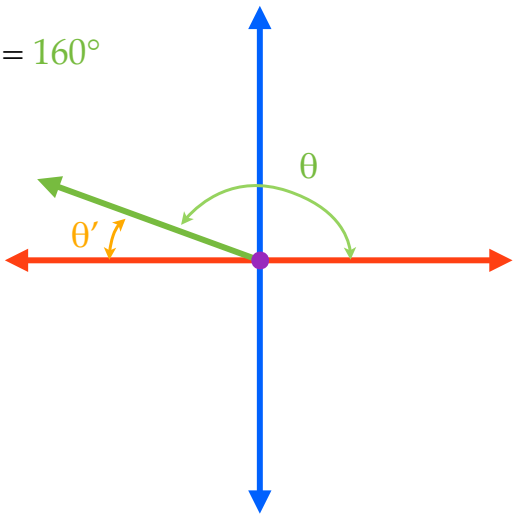
Given θ is in standard position, the reference angle of θ, noted θ′, is the acute angle formed by the terminal side of θ and the horizontal x-axis.



Given $\theta = \frac{\pi}{3}$

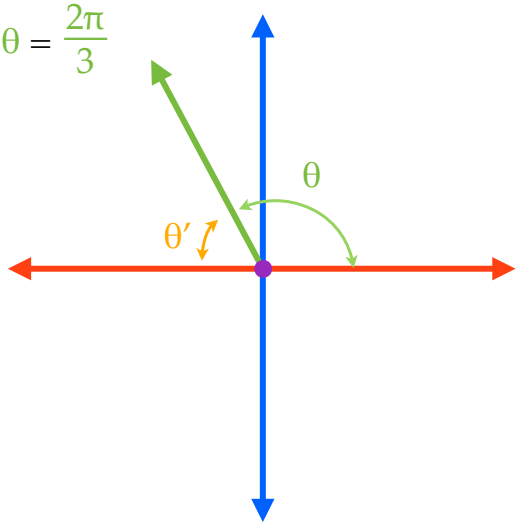
Given θ is in standard position, the reference angle of θ, noted θ′, is the acute angle formed by the terminal side of θ and the horizontal x-axis.

Given $\theta = 160°$

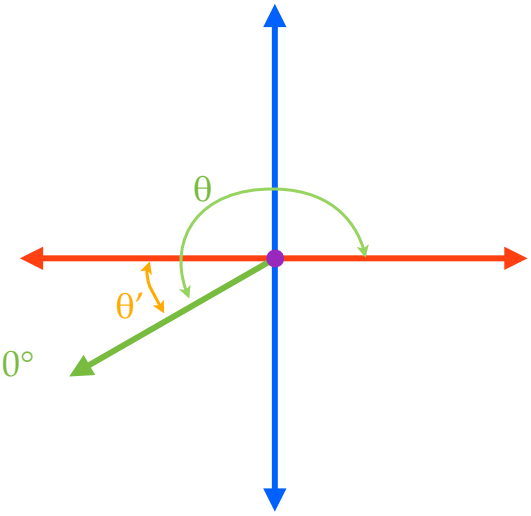


Given θ is in standard position, the reference angle of θ, noted θ′, is the acute angle formed by the terminal side of θ and the horizontal x-axis.

Given $\theta = \frac{2\pi}{3}$

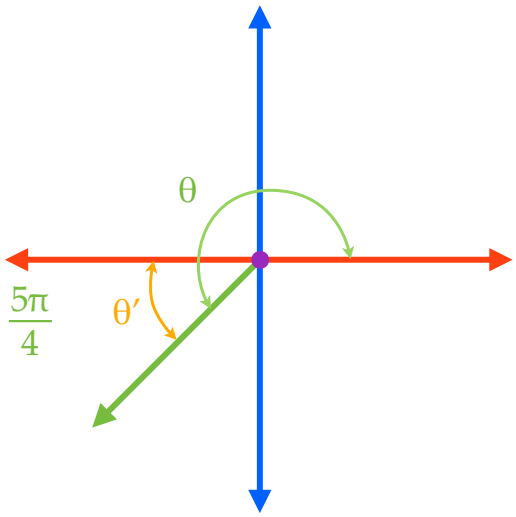


Given θ is in standard position, the reference angle of θ, noted θ′, is the acute angle formed by the terminal side of θ and the horizontal x-axis.



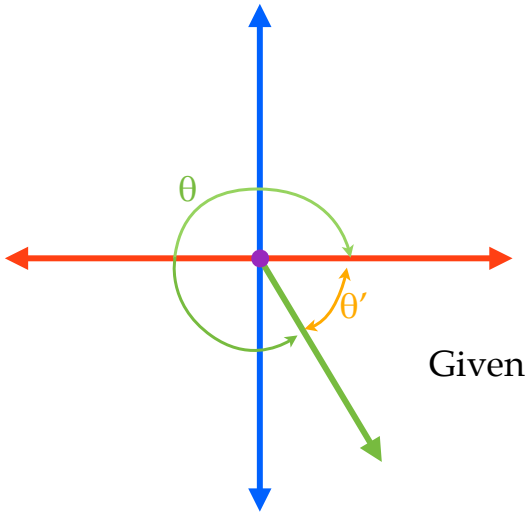
Given θ = 210°

Given θ is in standard position, the reference angle of θ, noted θ′, is the acute angle formed by the terminal side of θ and the horizontal x-axis.



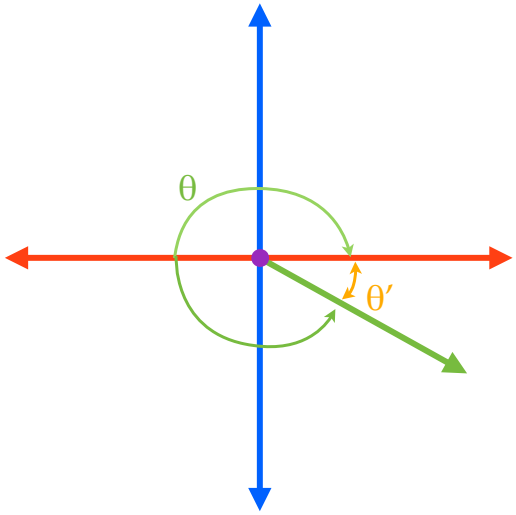
Given $\theta = \frac{5\pi}{4}$

Given θ is in standard position, the reference angle of θ, noted θ′, is the acute angle formed by the terminal side of θ and the horizontal x-axis.



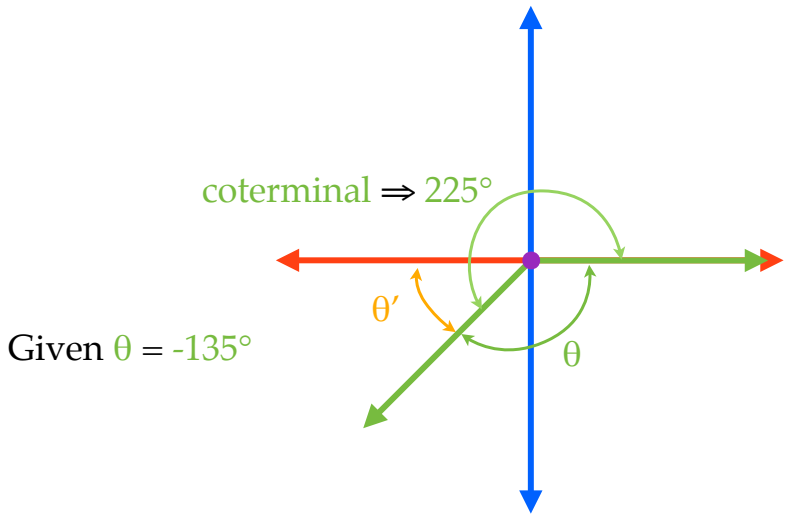
Given θ = 300°

Given θ is in standard position, the reference angle of θ, noted θ′, is the acute angle formed by the terminal side of θ and the horizontal x-axis.



Given $\theta = \frac{11\pi}{6}$

Given θ is in standard position, the reference angle of θ, noted θ′, is the acute angle formed by the terminal side of θ and the horizontal *x*-axis.



Given θ is in standard position, the reference angle of θ, noted θ′, is the acute angle formed by the terminal side of θ and the horizontal *x*-axis.