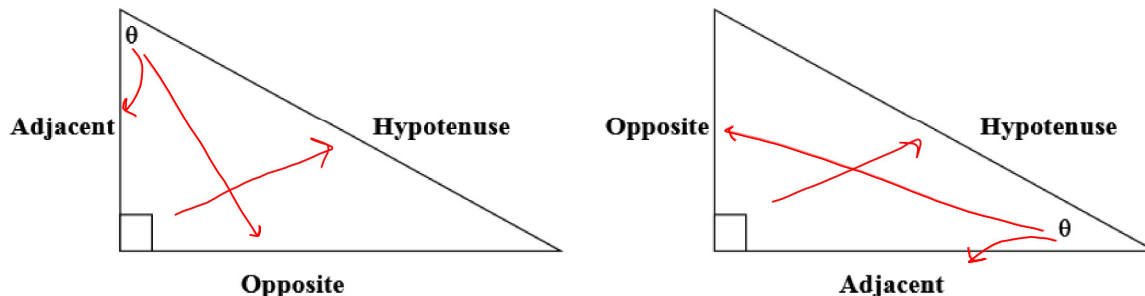


Pre-Calculus 11 Angles in Standard Position

Review Right Angle Trigonometry

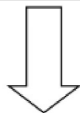
Label the sides in relation to the angle:



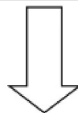
Recall: Pythagorean Theorem

$$a^2 + b^2 = c^2$$

SOH	CAH	TOA
------------	------------	------------



$$\sin \theta = \frac{\text{opposite}}{\text{hypotenuse}}$$

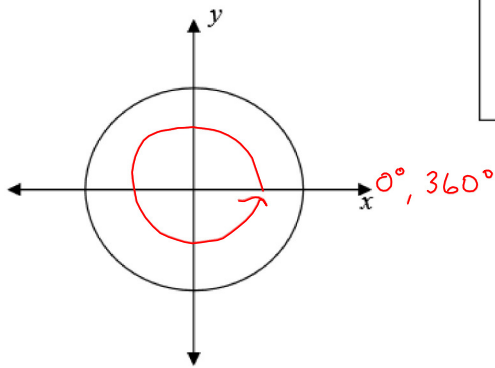


$$\cos \theta = \frac{\text{adjacent}}{\text{hypotenuse}}$$



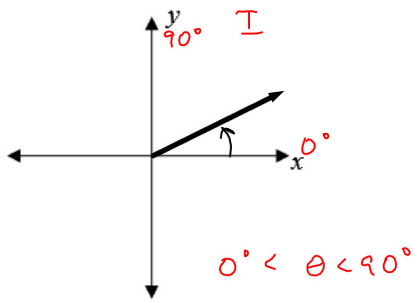
$$\tan \theta = \frac{\text{opposite}}{\text{adjacent}}$$

Angles in Standard Position

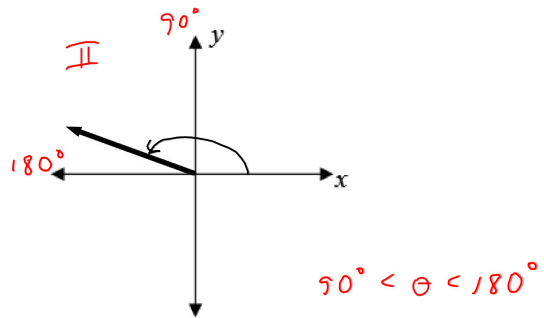


An angle is in standard position, if the angle θ , between 0° and 360° , is measured counterclockwise from the positive x-axis. (ccw)

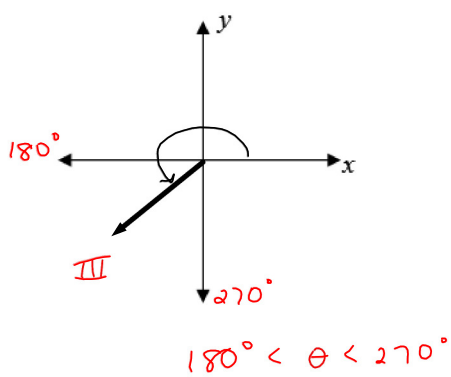
Quadrant I



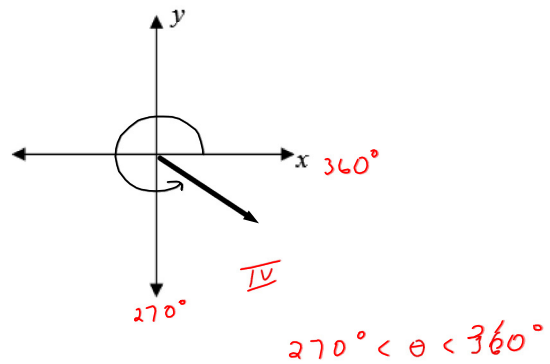
Quadrant II



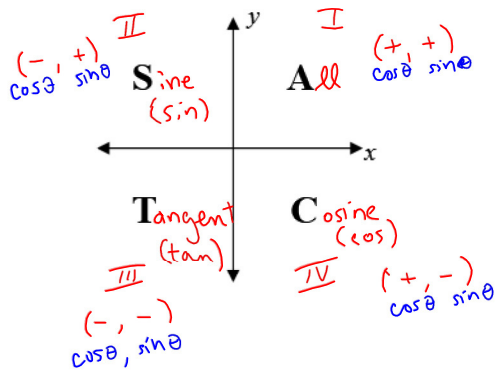
Quadrant III



Quadrant IV



CAST Rule



$(x, y) \rightarrow (\cos \theta, \sin \theta)$

*on the unit circle

CAST Rule

The letter indicates the trig function that is positive in that Quadrant. All other trig functions would be negative.

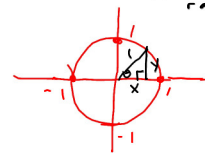
QI – All are positive

QII – Sine (y) is positive

QIII – Tangent (y/x) is positive $\frac{\sin \theta}{\cos \theta}$

QIV – Cosine (x) is positive

unit circle radius is 1



Examples

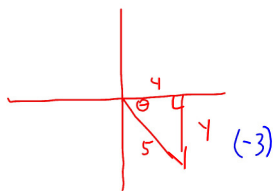
1. Use your calculator to determine each of the following.

a) $\cos 200^\circ = -0.93969$ (x-coordinate is negative in Quadrant III)

b) $\tan 315^\circ = -1.0$ (x-coordinate is positive, y-coordinate is negative in Quadrant IV)

c) $\sin 150^\circ = 0.5$ (y-coordinate is positive in Quadrant II)

2. Given that $\cos \theta = \frac{4}{5}$, determine the exact values of the other primary trigonometric ratios of the angle θ in Quadrant IV.



$\cos \theta = \frac{4}{5}$

$\cos \theta = \frac{\text{adj}}{\text{hyp}}$

$x^2 + y^2 = r^2$ (from $a^2 + b^2 = c^2$)

$4^2 + y^2 = 5^2$

$y^2 = 25 - 16$

$y^2 = 9$

$y = \pm 3$

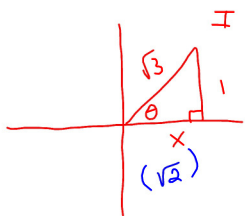
in QIV $\therefore y = -3$

$\sin \theta = \frac{-3}{5}$ (opp/hyp)

$\tan \theta = \frac{-3}{4}$ (opp/adj)

(3, 4, 5 triplet)
 ↑
 *hypotenuse

3. Determine the exact values of the other primary trigonometric function if $\sin \theta = \frac{1}{\sqrt{3}}$ in Quadrant I.



$\sin \theta = \frac{1}{\sqrt{3}}$ (opp/hyp)

$x^2 + y^2 = r^2$
 $x^2 + 1^2 = (\sqrt{3})^2$

$x^2 = 3 - 1$

$x^2 = 2$

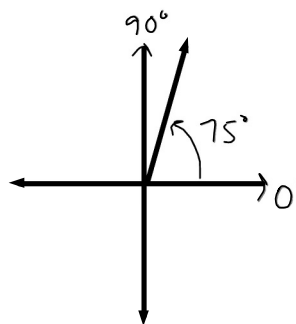
$x = \pm \sqrt{2}$

in QI $\therefore x = \sqrt{2}$

$\cos \theta = \frac{\sqrt{2}}{\sqrt{3}}$ ($\frac{\sqrt{2}}{\sqrt{3}}$)
 $= \frac{\sqrt{6}}{3}$

$\tan \theta = \frac{1}{\sqrt{2}}$ ($\frac{1}{\sqrt{2}}$)
 $= \frac{\sqrt{2}}{2}$

#3



Assignment: Pg. 448; #3, 5, 7, 13, worksheet #1 a, c, e, g, i, k #2 a, c, e, g