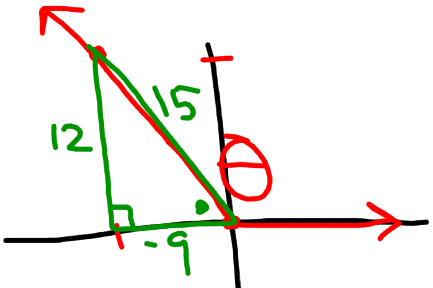
# Trig Values Using Points

Suppose (-9, 12) is a point on the terminal side of an angle θ in standard position. Evaluate the six trig functions of θ.




$9^2+12^2=c^2$

$81+144=c^2$

$225=c^2$

$15=c$

$\sin\theta = \frac{opp}{hyp} = \frac{12}{15} = \frac{4}{5}$

$\cos\theta = \frac{adj}{hyp} = \frac{-9}{15} = \frac{-3}{5}$

$\tan\theta = \frac{opp}{adj} = \frac{12}{-9} = -\frac{4}{3}$

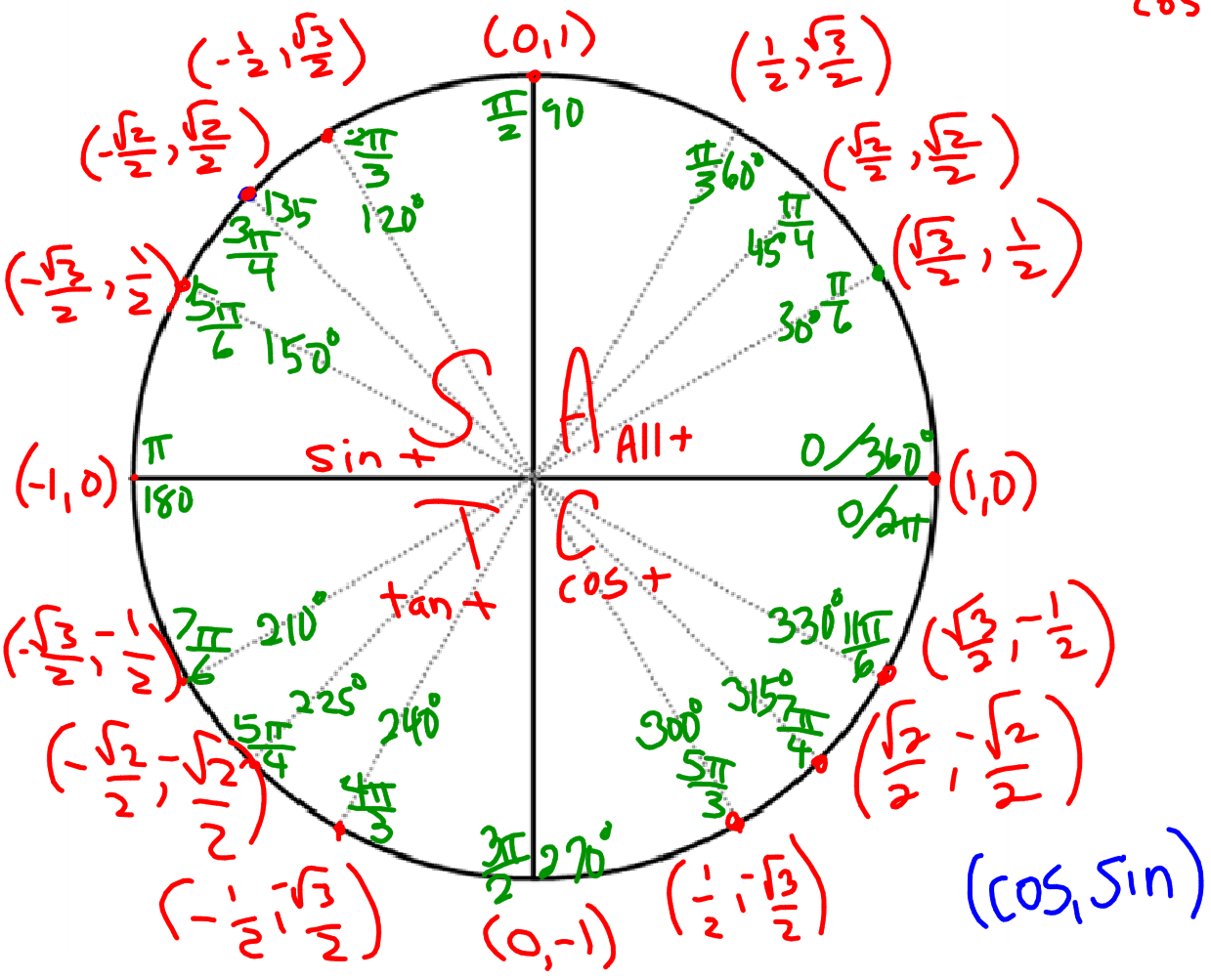
$\sec\theta = \frac{1}{\cos} = -\frac{5}{3}$

$\csc\theta = \frac{1}{\sin} = \frac{5}{4}$

$\cot\theta = \frac{1}{\tan} = -\frac{3}{4}$

# The Unit Circle

$\tan = \frac{\sin}{\cos}$



Name_____ Reference Angle Worksheet

Complete each part for each expression:

Note: If the angle is a quadrantal angle, then write "Quadrantal" for part A. Skip parts B and C, then answer part D. Your answer for Part D will then be one of the following: *0, 1, -1, or undefined.*

A. Determine in which quadrant the angle θ lies.
B. Determine the reference angle θ'. go to the nearest X-axis
C. Find the indicated ratio for θ'. This must be an exact value.
D. Determine the value for the original expression using the ASTC mneumonic.

S | A
T | C

| 1. $\sin\frac{\pi}{4}$ | 2. $\sin\frac{3\pi}{4}$ | 3. sin 225 | 4. sin 315 | 5. $\cos\frac{\pi}{6}$ |
|---|---|---|---|---|
| A. | A. II | A. | A. | A. |
| B. | B. 45° | B. | B. | B. |
| C. | C. $\frac{\sqrt{2}}{2}$ | C. | C. | C. |
| D. | D. $\sqrt{2}$ | D. | D. | D. |

6. cos 150

A. II

B. 30°

C. $\frac{\sqrt{3}}{2}$

D. $-\frac{\sqrt{3}}{2}$

17. [redacted] tan [redacted] 60

A. I

B. 60°

C. $\sqrt{3}$

D. $\sqrt{3}$