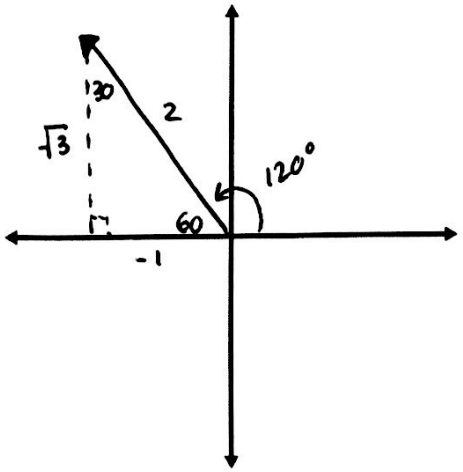
Algebra 2
13.3C - x, y and r and ASTC

Name KEY
Date: _____ **Period:** ____

Find the 6 trig functions for each angle in standard position having the given point on its terminal side.

1.) $\theta = 120°$



$\sin\theta =$ $\sqrt{3}/2$

$\csc\theta =$ $\frac{2}{\sqrt{3}} = \frac{2\sqrt{3}}{3}$

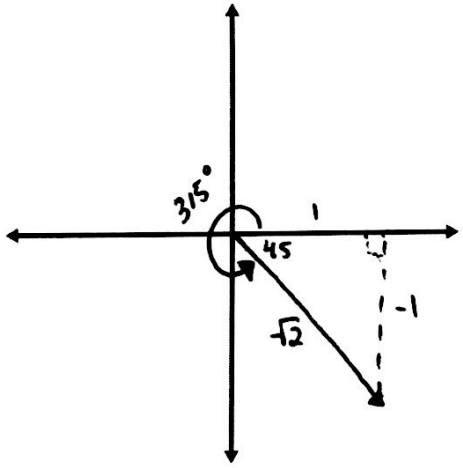
$\cos\theta =$ $\frac{-1}{2}$

$\sec\theta =$ -2

$\tan\theta =$ $-\sqrt{3}$

$\cot\theta =$ $\frac{-1}{\sqrt{3}} = \frac{-\sqrt{3}}{3}$

2.) $\theta = 315°$



$\sin\theta =$ $\frac{-1}{\sqrt{2}} = \frac{-\sqrt{2}}{2}$

$\csc\theta =$ $-\sqrt{2}$

$\cos\theta =$ $\frac{1}{\sqrt{2}} = \frac{\sqrt{2}}{2}$

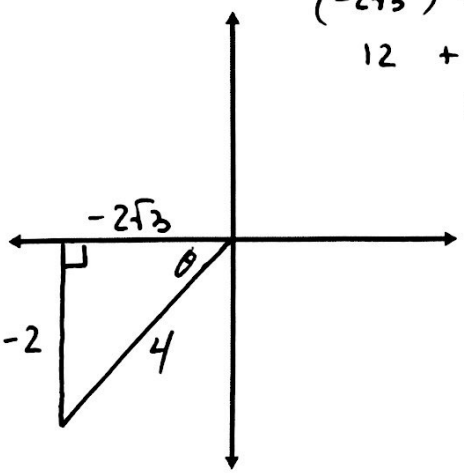
$\sec\theta =$ $\sqrt{2}$

$\tan\theta =$ -1

$\cot\theta =$ -1

3.) $(-2\sqrt{3}, -2)$

$(-2\sqrt{3})^2 + (-2)^2 = R^2$
$12 + 4 = R^2$
$16 = R^2$
$4 = R$



$\sin\theta =$ $\frac{-2}{4} = \frac{-1}{2}$

$\csc\theta =$ -2

$\cos\theta =$ $\frac{-2\sqrt{3}}{4} = \frac{-\sqrt{3}}{2}$

$\sec\theta =$ $\frac{2}{-\sqrt{3}} = \frac{2\sqrt{3}}{-3}$

$\tan\theta =$ $\frac{-2}{-2\sqrt{3}} = \frac{1}{\sqrt{3}} = \frac{\sqrt{3}}{3}$

$\cot\theta =$ $\sqrt{3}$

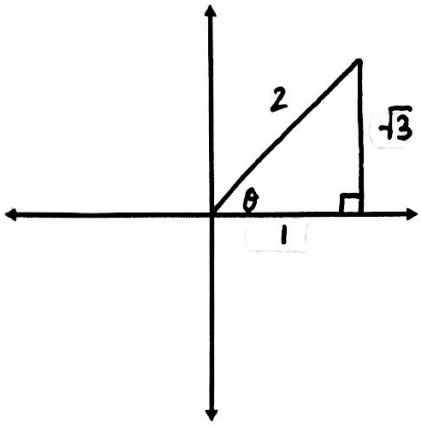
4.) $(1, \sqrt{3})$

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

$1 + 3 = r^2$

$4 = r^2$

$2 = r$

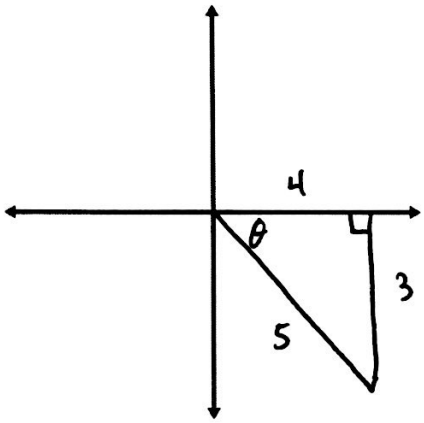


$\sin\theta =$ $\frac{\sqrt{3}}{2}$ $\csc\theta =$ $\frac{2}{\sqrt{3}} = \frac{2\sqrt{3}}{3}$

$\cos\theta =$ $\frac{1}{2}$ $\sec\theta =$ 2

$\tan\theta =$ $\frac{\sqrt{3}}{1} = \sqrt{3}$ $\cot\theta =$ $\frac{1}{\sqrt{3}} = \frac{\sqrt{3}}{3}$

5.) $\sin\theta = \frac{3}{5}$ in Quadrant IV



$\sin\theta =$ $\frac{3}{5}$ $\csc\theta =$ $\frac{5}{3}$

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

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

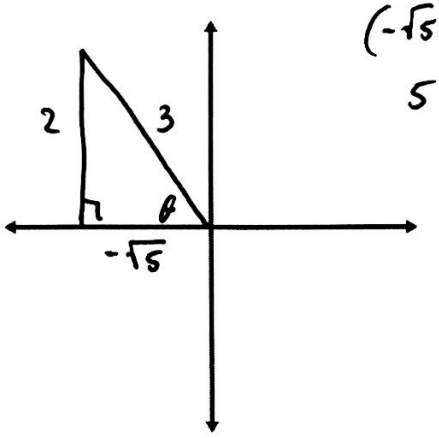
6.) $\tan\theta = -\frac{2}{\sqrt{5}}$ in Quadrant II

$(-\sqrt{5})^2 + (2)^2 = r^2$

$5 + 4 = r^2$

$9 = r^2$

$3 = r$



$\sin\theta =$ $2/3$ $\csc\theta =$ $3/2$

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

$\tan\theta =$ $\frac{2}{-\sqrt{5}} = \frac{-2\sqrt{5}}{5}$ $\cot\theta =$ $\frac{-\sqrt{5}}{2}$

Suppose that the point (x, y) is in the indicated quadrant. Decide whether the given ratio is <u>positive</u> or <u>negative.</u>

7.) III; $\frac{y}{r}$

NEGATIVE

8.) IV; $\frac{x}{y}$

NEGATIVE

9.) II; $\frac{y}{r}$

POSITIVE

10.) III; $\frac{x}{r}$

NEGATIVE