KEY

A

Name: _____

Precalculus

Test through 5.2

Exact values of trig functions

Find the exact value. Do not use a calculator.

1) $\sin\frac{11\pi}{3} = \frac{-\sqrt{3}}{2}$

$\frac{11}{3} = 3\frac{2}{3}\pi$

$\Rightarrow 1\frac{2}{3}\pi \Rightarrow \pi$

$\sin 60 = \frac{\sqrt{3}}{2}$

2) $\cos\frac{11\pi}{4} = \frac{-\sqrt{2}}{2}$

$\frac{11\pi}{4} = 2\frac{3}{4}\pi \rightarrow \frac{3\pi}{4}$

3) $\tan\frac{15\pi}{4} = -1$

$\frac{15}{4} = 3\frac{3}{4} \rightarrow 1\frac{3}{4} \Rightarrow 315$

4) $\cot(60^\circ)$

$\tan 60 = \frac{\sin 60}{\cos 60} = \frac{\sqrt{3}/2}{1/2} = \sqrt{3}$

$\cot 60 = \frac{1}{\sqrt{3}} = \frac{\sqrt{3}}{3}$

5) $\csc(150^\circ)$

$\sin 150 = \frac{1}{2}$

$\csc 150 = \frac{1}{\frac{1}{2}}$

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6) $\sec(225^\circ)$

$\cos 225 = -\frac{\sqrt{2}}{2}$

$\sec 225 = -\frac{2}{\sqrt{2}} = -\sqrt{2}$

Draw reference triangles for these angles. Find and label the lengths of all three sides.
Use the values 0, 1, 2, $\sqrt{2}$, or $\sqrt{3}$ for the lengths.

7) 120°

$\cos 60 = \frac{1}{2}$

8) 315°

$\cos 45 = \frac{\sqrt{2}}{2}$

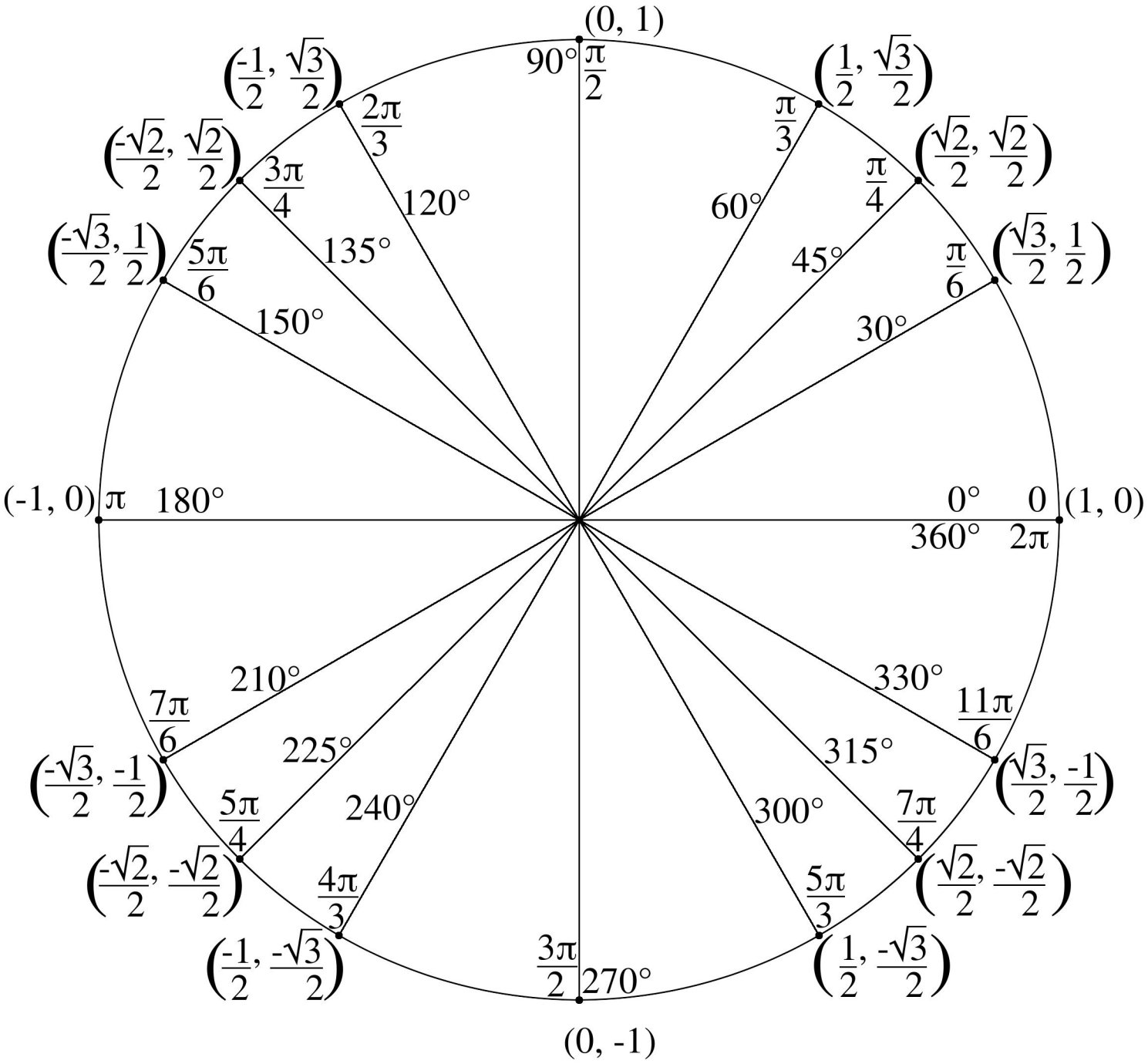
9) 240°

$\cos 60 = \frac{1}{2}$

10) 300°

$\cos 60 = \frac{1}{2}$

The Unit Circle



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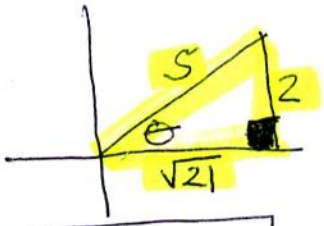
Find the exact value of the remaining 5 trigonometric functions.

11) $\sin\theta = \frac{2}{5}$

$\sqrt{25-4} = \sqrt{21}$



$\cos\theta = \frac{\sqrt{21}}{5}$

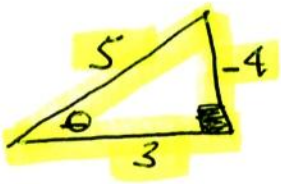
$\tan\theta = \frac{2}{\sqrt{21}} = \frac{2\sqrt{21}}{21} = \tan\theta$

$\cot\theta = \frac{\sqrt{21}}{2}$

$\sec\theta = \frac{5}{\sqrt{21}} \Rightarrow \sec\theta = \frac{5\sqrt{21}}{21}$

$\csc\theta = \frac{5}{2}$

12) $\tan\theta = \frac{-4}{3}$



$\sin\theta = -\frac{4}{5}$

$\cos\theta = \frac{3}{5}$

$\sec\theta = \frac{5}{3}$

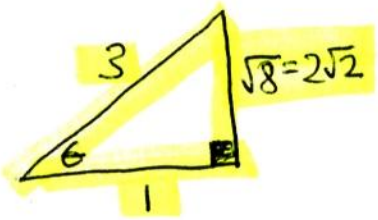
$\csc\theta = \frac{-5}{4}$

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

$\sqrt{3^2+4^2} = \sqrt{9+16} = \sqrt{25} = 5$

13) $\sec\theta = 3$

$\sqrt{3^2-1^2} = \sqrt{9-1} = \sqrt{8}$



$\cos\theta = \frac{1}{3}$

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

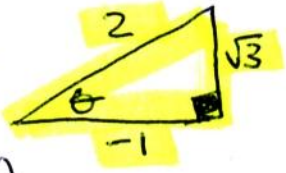
$\tan\theta = 2\sqrt{2}$

$\cot\theta = \frac{1}{2\sqrt{2}} = \frac{\sqrt{2}}{4} = \cot\theta$

$\csc\theta = \frac{3}{2\sqrt{2}} = \frac{3\sqrt{2}}{4} = \csc\theta$

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

$\sqrt{2^2-1^2} = \sqrt{4-1} = \sqrt{3}$



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

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

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

$\sec\theta = -2$

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