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Date _____
Algebra II

Pythagorean Identity

1. Using the identity $\sin^2\theta + \cos^2\theta = 1$, find the six trigonometric values if $\sin\theta = .4$ and θ is in Quadrant I. Round all values to the nearest hundredth.

a) $\sin\theta =$ .4 b) $\cos\theta =$ .92 c) $\tan\theta =$ .43

$\frac{\sin\theta}{\cos\theta}$

$\frac{.4}{.92} = .43$

$\sin^2\theta + \cos^2\theta = 1$

$(.4)^2 + \cos^2\theta = 1$

$.16 + \cos^2\theta = 1$

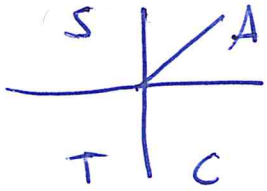
$-.16 \quad -.16$

$\sqrt{\cos^2\theta} = \sqrt{.84}$

$\cos\theta = .92$

d) $\csc\theta =$ 2.5 e) $\sec\theta =$ 1.09 f) $\cot\theta =$ 2.33

$\frac{1}{.4} = 2.5$ $\frac{1}{.92} = 1.09$ $\frac{1}{.43} = 2.33$



2. Using the identity $\sin^2\theta + \cos^2\theta = 1$, find the six trigonometric values if $\cos\theta = -.2$ and θ is in Quadrant III. Round all values to the nearest hundredth.

a) $\sin\theta =$ .96 b) $\cos\theta =$ -.28 c) $\tan\theta =$ -3.43

$\sin^2\theta + \cos^2\theta = 1$

$\sin^2\theta + (-.2)^2 = 1$

$\sin^2\theta + .04 = 1$

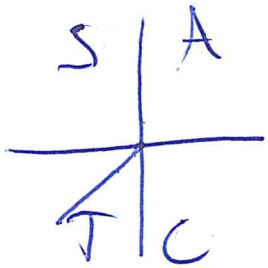
$-.04 \quad -.04$

$\sqrt{\sin^2\theta} = \sqrt{.96}$

$\sin\theta = .98$

d) $\csc\theta =$ 1.04 e) $\sec\theta =$ -3.57 f) $\cot\theta =$ -.29

$\frac{1}{.96} = 1.04$ $\frac{1}{-.28} = -3.57$ $\frac{1}{-3.43} = -.29$



3. Using the identity $\sin^2\theta + \cos^2\theta = 1$, find the six trigonometric values if $\cos\theta = -.28$ and θ is in Quadrant II. Round all values to the nearest hundredth.

a) $\sin\theta =$ .96

b) $\cos\theta =$ −.28

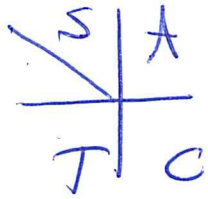
c) $\tan\theta =$ $\frac{\sin\theta}{\cos\theta}$ $\frac{.96}{-.28} = -3.43$

$\sin^2\theta + \cos^2\theta = 1$
$\sin^2\theta + (-.28)^2 = 1$
$\sin^2\theta + .0784 = 1$
$-.0784 \quad -.0784$
$\sqrt{\sin^2\theta} = \sqrt{.9216}$
$\sin\theta = .96$

d) $\csc\theta =$ $\frac{1}{.96}$ 1.04

e) $\sec\theta =$ $\frac{1}{-.28}$ −3.57

f) $\cot\theta =$ $\frac{1}{-3.43}$ −.29



4. Using the identity $\sin^2\theta + \cos^2\theta = 1$, find the six trigonometric values if $\sin\theta = -.15$ and $\cos\theta < 0$. Round all values to the nearest hundredth.

b) $\sin\theta =$ −.15

b) $\cos\theta =$ −.99

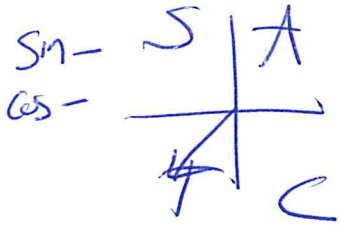
c) $\tan\theta =$ $\frac{\sin\theta}{\cos\theta}$ $\frac{-.15}{-.99} = .15$

$\sin^2\theta + \cos^2\theta = 1$
$-.15^2 + \cos^2\theta = 1$
$.0225 + \cos^2\theta = 1$
$-.0225 \quad -.0225$
$\sqrt{\cos^2\theta} = \sqrt{.9775}$
$\cos\theta = .99$

e) $\csc\theta =$ $\frac{1}{-.15}$ −6.67

e) $\sec\theta =$ $\frac{1}{-.99}$ 1.01

f) $\cot\theta =$ $\frac{1}{.15}$ 6.67



5. Using the identity $\sin^2\theta + \cos^2\theta = 1$, find the value of $\tan\theta$, to the *nearest hundredth*, if $\cos\theta$ is –0.7 and θ is in Quadrant II.

$\sin^2\theta + \cos^2\theta = 1$
$\sin^2\theta + (-0.7)^2 = 1$
$\sin^2\theta + .49 = 1$
$-.49 \quad -.49$
$\sqrt{\sin^2\theta} = \sqrt{.51}$
$\sin\theta = .71\ldots$

$\tan\theta = \frac{\sin\theta}{\cos\theta}$
$\tan\theta = \frac{.71\ldots}{-0.7}$
$\tan\theta = -1.02$