Precalculus preAP
Trigonometric Identities

name: _____
date: _____

Let's go on a great exploration to find out our true identities. You will put on your Smarticle Caps and use your calculator to fill out the following chart. Make sure NEVER to use rounded values – either store values and re-use, or calculate in place. Let' begin!

θ	$\sin\theta$	$\cos\theta$	$\sin^2\theta$	$\cos^2\theta$	$\sin^2\theta + \cos^2\theta$
33.5°					
–96°					
200°					
180°					
137.2°					
–9876°					

Your detective work leads you to conjecture that: _____

Your mathematical training makes you want to prove it without a doubt:

$\sin\theta + \cos\theta =$ _____ (use the "x, y, r" definitions of sine and cosine to rewrite)

$\sin^2\theta + \cos^2\theta =$ _____ (use your algebra skills and the "x, y, r" definitions to adjust)

$=$ _____ (combine correctly into one fraction)

$=$ _____ (consider Pythagorean Theorem and reference triangle information to simplify the numerator)

$=$ _____ (simplify and Voila!)

CONCLUSION: _____

Using your CORRECT conclusion equation/identity,

- Rewrite the equation isolating the $\cos^2\theta$ term: _____
- Rewrite the equation isolating the $\sin^2\theta$ term: _____

Next Exploration: (remember NOT to use rounded values in ANY calculations)

θ	$\sin\theta$	$\cos\theta$	$\tan\theta$	$\frac{\sin\theta}{\cos\theta}$
49.32°				
−88°				
2843°				
156°				
0°				
90°				

Your detective work leads you to conjecture that: _____ (but only in the case that): _____

Your mathematical training makes you want to prove it without a doubt:

$\frac{\sin\theta}{\cos\theta}$ = _____ (rewrite using the "x, y, r" definitions of sine and cosine)

= _____ (use your stellar fraction division skills to simplify one step)

= _____ (simplify again if needed)

= _____ (rewrite as a trigonometric function using "x, y, r" definitions)

CONCLUSION: _____

That was so fun, let's flip it on its head:

$\frac{\cos\theta}{\sin\theta}$ = _____ (rewrite using the "x, y, r" definitions of sine and cosine)

= _____ (use your stellar fraction division skills to simplify one step)

= _____ (simplify again if needed)

= _____ (rewrite as a trigonometric function using "x, y, r" definitions)

CONCLUSION: _____