Name Mine   Date ____________

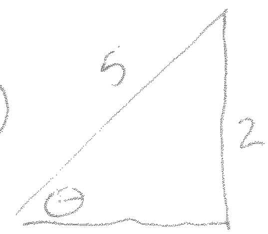
Math 112: #13 A/B/C/D

A) Use a right triangle to express $\cos(\csc^{-1}(^5/_2))$ as a single square root.

$\csc^{-1}\left(\frac{5}{2}\right) = \theta$ & $\cos\theta$ = answer

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

(or $\sin\theta = ^2/_5$)



using

$a^2 = 5^2 - 2^2$
$= 25 - 4 = 21$
$a = \sqrt{21}$

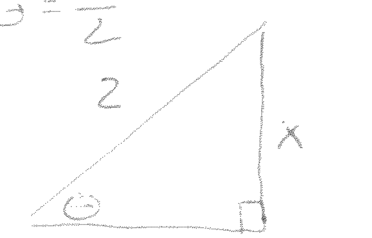
$\cos\theta = \frac{\sqrt{21}}{5}$

$= \sqrt{\frac{21}{25}}$

B) Use a right triangle to express $\tan(\sin^{-1}(^x/_2))$ a single square root.

$\sin^{-1}\left(\frac{x}{2}\right) = \theta$ $\tan\theta$ = answer

$\sin\theta = \frac{x}{2}$



$a^2 = 2^2 - x^2$
$= 4 - x^2$
$a = \sqrt{4-x^2}$

$\tan\theta = \frac{x}{\sqrt{4-x^2}}$

$= \frac{\sqrt{x^2}}{\sqrt{4-x^2}}$

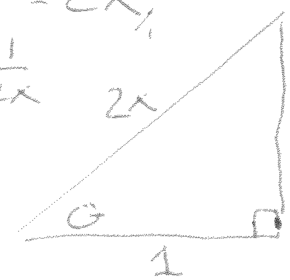
$= \sqrt{\frac{x^2}{4-x^2}}$

C) Use a right triangle to express $\sin(\sec^{-1}(2x))$ as a single square root.

$\sec^{-1}(2x) = \theta \qquad \sin\theta = \text{answer}$

$\sec\theta = 2x/1$

$1/\cos\theta = \frac{1}{2x}$



$a^2 = (2x)^2 - 1^2$

$= 4x^2 - 1$

$a = \sqrt{4x^2-1}$

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

$$= \frac{\sqrt{4x^2-1}}{\sqrt{4x^2}}$$

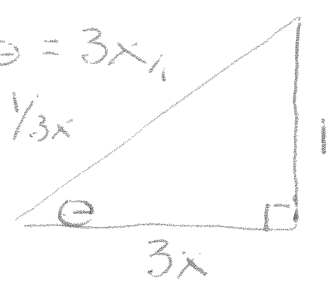
$$= \sqrt{\frac{4x^2-1}{4x^2}} = \sqrt{\frac{4x^2}{4x^2} - \frac{1}{4x^2}} = \sqrt{1 - \frac{1}{4x^2}}$$

D) Use a right triangle to express $\cos(\cot^{-1}(3x))$ as a single square root.

$\cot^{-1}(3x) = \theta \qquad$ looking for $\cos\theta$

$\cot\theta = 3x/1$

$1/\tan = 1/3x$



$c^2 = (3x)^2 + 1^2$

$= 9x^2 + 1$

$c = \sqrt{9x^2+1}$

$$\cos\theta = \frac{3x}{\sqrt{9x^2+1}}$$

$$= \frac{\sqrt{(3x)^2}}{\sqrt{9x^2+1}} = \sqrt{\frac{9x^2}{9x^2+1}}$$