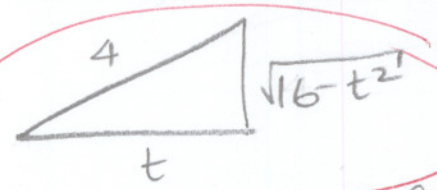
Math 49B
Group Quiz 2
Wed Jan 23, 2008

Names: BLUE

THIS IS A NO CALCULATOR QUIZ

[2 POINTS] Write an algebraic expression that is equivalent to $\tan\left(\underbrace{\arccos\frac{t}{4}}_{\theta}\right)$. **HINT: USE TRIANGLES.**

1



$\theta = \arccos\frac{t}{4}$

$\cos\theta = \frac{t}{4}$

1

$\tan\theta = \frac{\sqrt{16-t^2}}{t} = \tan\left(\arccos\frac{t}{4}\right)$

[2 POINTS] Determine if the following statement is true or false. **If it is true, explain briefly. If it is false, give a counterexample.**

$$\arctan x = \frac{\arcsin x}{\arccos x}$$

FALSE 1

eg. $\arctan -1 = -\frac{\pi}{4}$ 1

$\frac{\arcsin -1}{\arccos -1} = \frac{-\frac{\pi}{2}}{\pi} = -\frac{1}{2}$

[3 POINTS] If $\tan x = \frac{5}{12}$ and $\sec x = -\frac{13}{12}$, find the value of $\csc x$ using identities, **NOT TRIANGLES.**

$\cos x = \frac{1}{\sec x} = -\frac{12}{13}$

$\frac{1}{2}$ POINT EACH

$\tan x = \frac{\sin x}{\cos x}$ so $\sin x = \tan x \cos x$

$= \frac{5}{12} \cdot -\frac{12}{13} = -\frac{5}{13}$

$\csc x = \frac{1}{\sin x} = -\frac{13}{5}$

[3 POINTS] Perform the addition and use fundamental identities to simplify $\frac{1}{1-\cos y} + \frac{1}{1+\cos y}$.

$= \frac{(1+\cos y) + (1-\cos y)}{(1-\cos y)(1+\cos y)}$

$= \frac{2}{1-\cos^2 y}$

$\frac{1}{2}$ POINT EACH

$= \frac{2}{\sin^2 y}$ OR

$= 2\csc^2 y$