

Quiz 1 Solutions

Math 220

September 8, 2008

1. Simplify $\tan(\arccos x)$.

Solution: To deal with $\arccos x$, draw a right triangle with an angle labeled θ where the adjacent leg has length x and the hypotenuse has length 1. By the Pythagorean theorem, the opposite leg has length $\sqrt{1-x^2}$. Then $\tan \theta = \frac{\sqrt{1-x^2}}{x}$.

2. Find the domain of the function $f(x) = \ln(2 - \sqrt{3+x})$.

Solution: Because you can only take the square root of a nonnegative number, we have $3+x \geq 0$ so $x \geq -3$. Because you can only take the natural logarithm of a positive number we have $2 - \sqrt{3+x} > 0$, so

$$\begin{aligned} 2 - \sqrt{3+x} &> 0 \\ 2 &> \sqrt{3+x} \\ 4 &> 3+x \\ 1 &> x. \end{aligned}$$

Thus the domain of the function is $[-3, 1)$.