

MATH 1A Quiz 1

Name: Solutions

- 1 Let $f(x) = \sqrt{1+x}$ and $g(x) = \sqrt{1-x}$. What is the domain of f/g ?

$$\text{Domain of } \frac{1+x}{1-x} = \text{Domain of } \sqrt{1+x} \cap \text{Domain of } \sqrt{1-x}$$

— zeros of $\sqrt{1-x}$.

$$= [-1, \infty) \cap (-\infty, 1]$$

— $\{1\}$

$$= \boxed{[-1, 1)}$$

- 2 Find a number δ such that if $|x-1| < \delta$ then $|f(x)-5| < \frac{1}{2}$, where $f(x) = 2x+3$.

Start with what we want:

$$|2x+3 - 5| < \frac{1}{2}$$

and simplify:

$$|2x - 2| < \frac{1}{2}$$

$$2|x-1| < \frac{1}{2}$$

$$|x-1| < \frac{1}{4}$$

So if $|x-1| < \frac{1}{4}$, then $|f(x)-5| < \frac{1}{2}$.

$$\boxed{\delta = \frac{1}{4}}$$