

## Math 111 Quiz #2 Solutions

1. (a) Evaluating the function at  $x = -3$ :  $f(-3) = \frac{1}{\sqrt{1-(-3)}} = \frac{1}{\sqrt{4}} = \boxed{\frac{1}{2}}$

(b) In order for the square root to be defined, we must have that the quantity inside the root is nonnegative, i.e.  $1 - x \geq 0 \Rightarrow 1 \geq x$ . So,  $x$  must be less than or equal to 1.

However, if  $x = 1$ , then the square root is 0 and we will have division by zero!! So we cannot have  $x = 1$ .

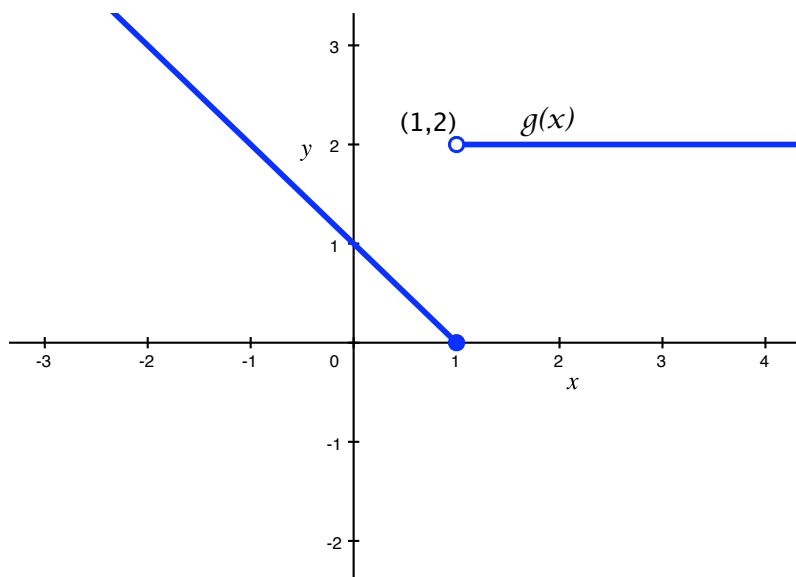
$$\Rightarrow \boxed{\text{The domain is } x < 1 \text{ or } (-\infty, 1).$$

(c) We are solving for  $x$  in the equation  $\frac{1}{\sqrt{1-x}} = \frac{1}{4}$ .

By cross-multiplying (or multiplying both sides by 4 and  $\sqrt{1-x}$ ), we have that

$$\begin{aligned} \sqrt{1-x} &= 4 \\ \Rightarrow 1-x &= 16 \quad (\text{Squaring both sides.}) \\ \Rightarrow \boxed{x} &= \boxed{-15} \end{aligned}$$

2. (a) For  $x \leq 1$ , the function is a line of slope  $-1$  with  $y$ -intercept 1.  
For  $x > 1$ , the function is a horizontal line with points that have  $y$ -coordinates equal to 2.



(b) When  $x = -5$ , the function is given by  $y = 1 - x$ . So,  $g(-5) = 1 - (-5) = 1 + 5 = \boxed{6}$ .