Math16500 Section 24244 Quiz 1
Fall 2022, August 29

Name:

Problem 1: Find whether the following functions are even or odd or neither.

1. $f(x) = \sqrt{2-x} - \sqrt{2+x}$
2. $f(x) = \lfloor x \rfloor$ (the floor function)

[2 x 10 pts].

Problem 2: Find the domain of the function

$$g(x) = \frac{x+1}{\sqrt{4-x^2}}$$

[30 pts].

Bonus Problem: Find the domain of the function

$$h(x) = \frac{x+1}{\sqrt{(x+1)^2(4-x^2)}}$$

[10 pts].

Problem 1

1. $f(-x) = \sqrt{2+x} - \sqrt{2-x} = -\left(\sqrt{2-x} - \sqrt{2+x}\right) = -f(x)$

$\Rightarrow f$ is an odd function.

2. $f(-x) = \lfloor -x \rfloor = -\lfloor x \rfloor - 1 = -f(x) - 1 \neq -f(x)$

$\neq f(x)$

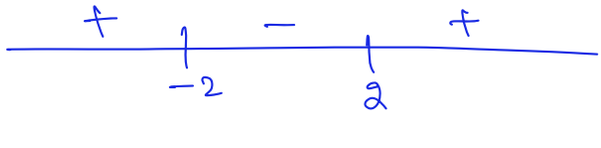
$\Rightarrow f$ is neither even nor odd.

Problem 2

$g(x) = \dfrac{x+1}{\sqrt{4-x^2}} \Rightarrow 4-x^2 \geq 0$ and $\sqrt{4-x^2} \neq 0 \Rightarrow 4-x^2 \neq 0$

$\Rightarrow 4-x^2 > 0 \Rightarrow x^2 - 4 < 0$

$\Rightarrow$ Domain $= (-2, 2)$



$\Rightarrow x \in (-2, 2)$

Bonus $\Rightarrow (x+1)^2(4-x^2) \geq 0$ and $\sqrt{(x+1)^2(4-x^2)} \neq 0 \Rightarrow x \neq -1$ and $4-x^2 \neq 0$

$\Rightarrow 4-x^2 > 0$ and $x \neq -1 \Rightarrow$ Domain $= (-2, 2) \setminus \{-1\}$

$= (-2, -1) \cup (-1, 2)$